NEC

N8406-022A 1Gb Intelligent L2 Switch

Browser-based Interface Reference Guide

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Getting started

Introduction

The 1Gb Intelligent L2 Switch software lets you use your Web browser to access switch information and statistics and perform switch configuration via the Internet.

This guide provides an overview of how to access and use the switch browser-based interface (BBI) on the Layer2 switch mode. For the information of how to use the SmartPanel mode, see the SmartPanel Reference Guide.

This chapter briefly describes the software features and requirements for the switch browser-based interface (BBI) and explains how to access the BBI start page.

Additional references

Additional information about installing and configuring the switch is available in the following guides.

- *N8406-022A 1Gb Intelligent L2 Switch User's Guide*
- *N8406-022A 1Gb Intelligent L2 Switch Application Guide*
- *N8406-022A 1Gb Intelligent L2 Switch Command Reference Guide (AOS)*
- *N8406-022A 1Gb Intelligent L2 Switch Command Reference Guide (ISCLI)*
- *N8406-022A 1Gb Intelligent L2 Switch SmartPanel Reference Guide*

Features

The network administrator can access all switch configuration and monitoring functions through the BBI, a Web-based switch management interface. The BBI has the following features:

- Most of the same configuration and monitoring functions as the command line interface
- Intuitive and easy-to-use interface structure
- Nothing to install; the BBI is part of the switch software
- Two default levels of password protection
- Can be upgraded as future software releases are available

Requirements

To use the browser-based interface, you need the following:

- PC or workstation with network access to the switch
- Frame-capable Web-browser software, such as the following:
  - Netscape Navigator 4.7x or higher
  - Internet Explorer 6.0x or higher
- JavaScript enabled in your Web browser

Switch setup

Before you can access the BBI, minimal configuration is required on the switch.

Configuring IP interfaces

At least one IP interface must be configured on the switch. This is usually done from the command line interface during first-time switch set up. Each IP interface address provides a point of access for switch management.

For more information about configuring an IP interface for management access, see the "Using the command line interface" section in the "Accessing the switch" chapter of the *Application Guide*.

Enabling or disabling BBI access

By default, BBI access is enabled. If you need to disable or re-enable access, use the following command from the command line interface:

```
>> Main# /cfg/sys/access/http <disable|enable (or just d|e)>
```

By default, secure BBI access is disabled. If you need to enable access, use the following command from the command line interface:

```
>> Main# /cfg/sys/access/https/access <disable|enable (or just d|e)>
```

The default TCP port to use for BBI access is port 80. To change the port number, use the following command:

```
>> Main# /cfg/sys/access/wport <TCP port number>
```

For more information on accessing and configuring the switch through the command line interface, see the *Command Reference Guide*.

Web browser setup

Most modern Web browsers work with frames and JavaScript by default, and require no additional set up. However, you should check your Web browser's features and configuration to be sure frames and JavaScript are enabled.

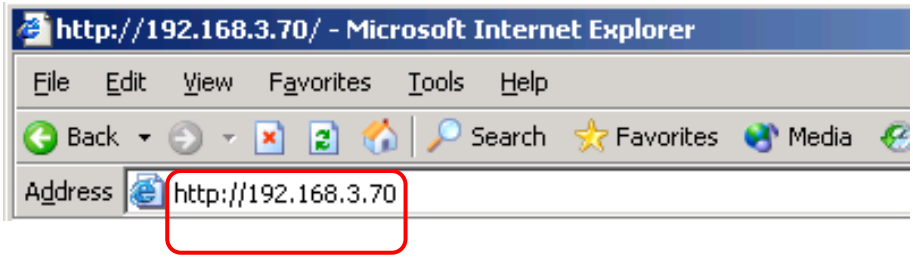
NOTE: JavaScript is not the same as Java™. Be sure that JavaScript is enabled in your Web browser.

Starting the BBI

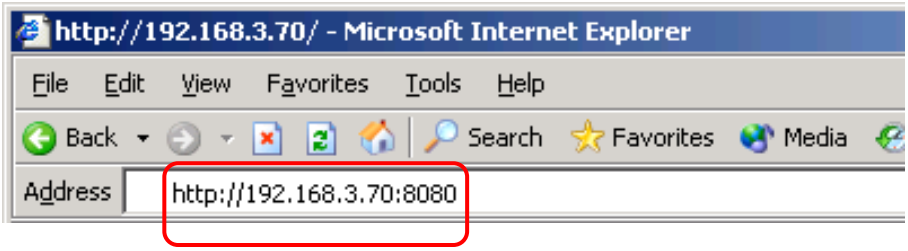
When the switch and browser setup is complete, follow these steps to launch the BBI:

1. Start your Web browser.
2. Enter the switch IP interface address in the Web browser Uniform Resource Locator (URL) field.

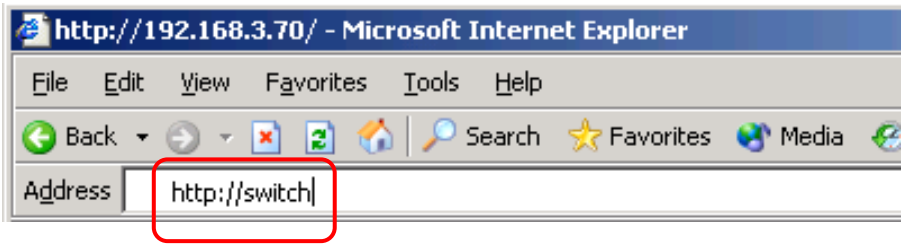
   For example, if the switch IP interface has a network IP address of 192.168.3.70. Using Internet Explorer, you could enter the following (for secure BBI access, use https://).


http://192.168.3.70/ - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address http://192.168.3.70

   If you do not use the default TCP port number (80) for BBI access, you can include the port number when you enter the IP address:


http://192.168.3.70/ - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address http://192.168.3.70:8080

If the switch IP interface address has a name on your local domain name server, you can enter the name instead. Using Internet Explorer, you can enter the following:



3. Log in to the switch.

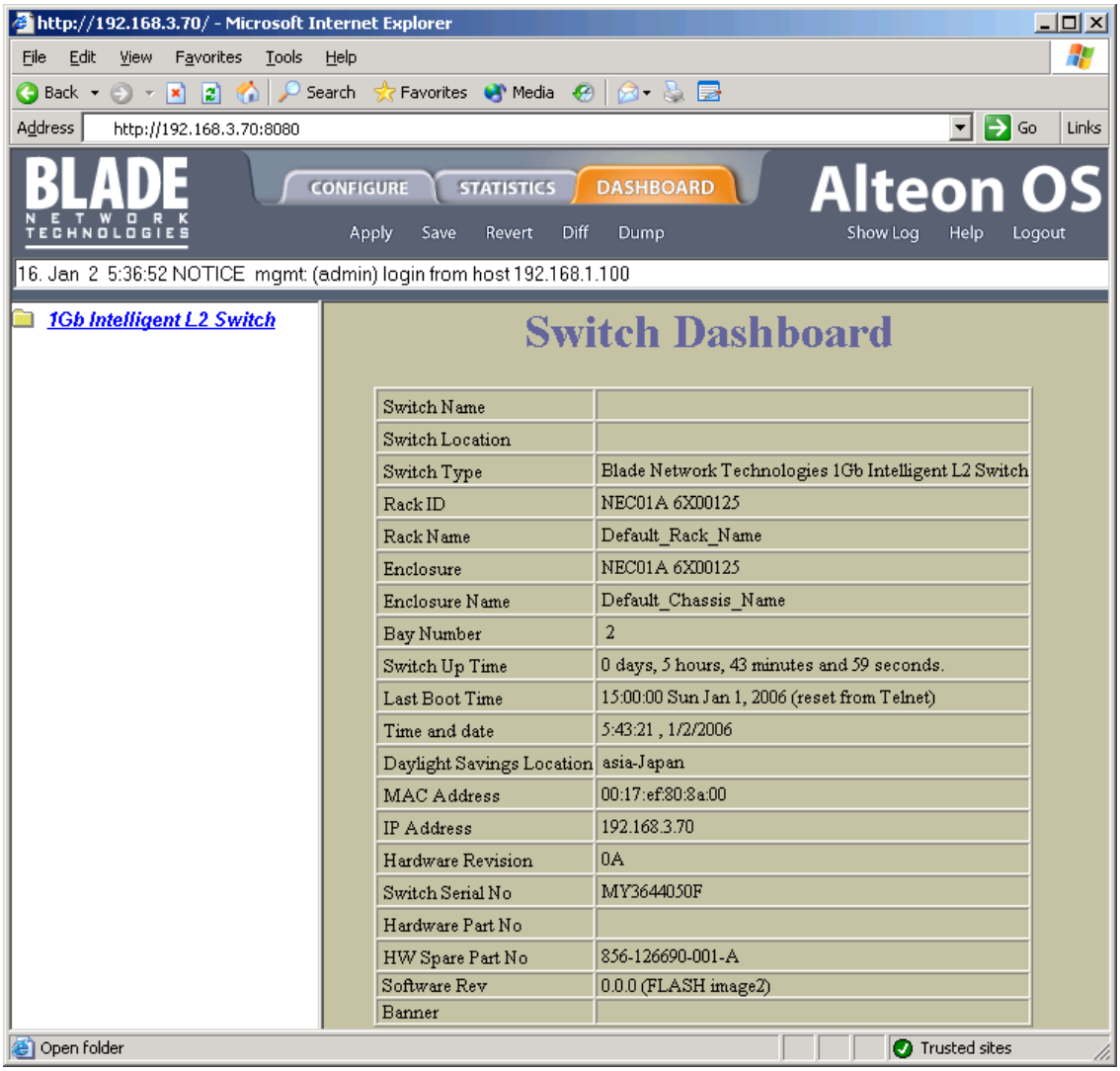
   If your switch and browser are properly configured, you will be asked to enter a password.

   Enter the account name and password for the switch.

   For more password information, see the *Command Reference Guide*.

4. Allow the BBI Dashboard page to load.

   When the proper account name and password combination is entered, the BBI Dashboard page is displayed in the browser viewing area.

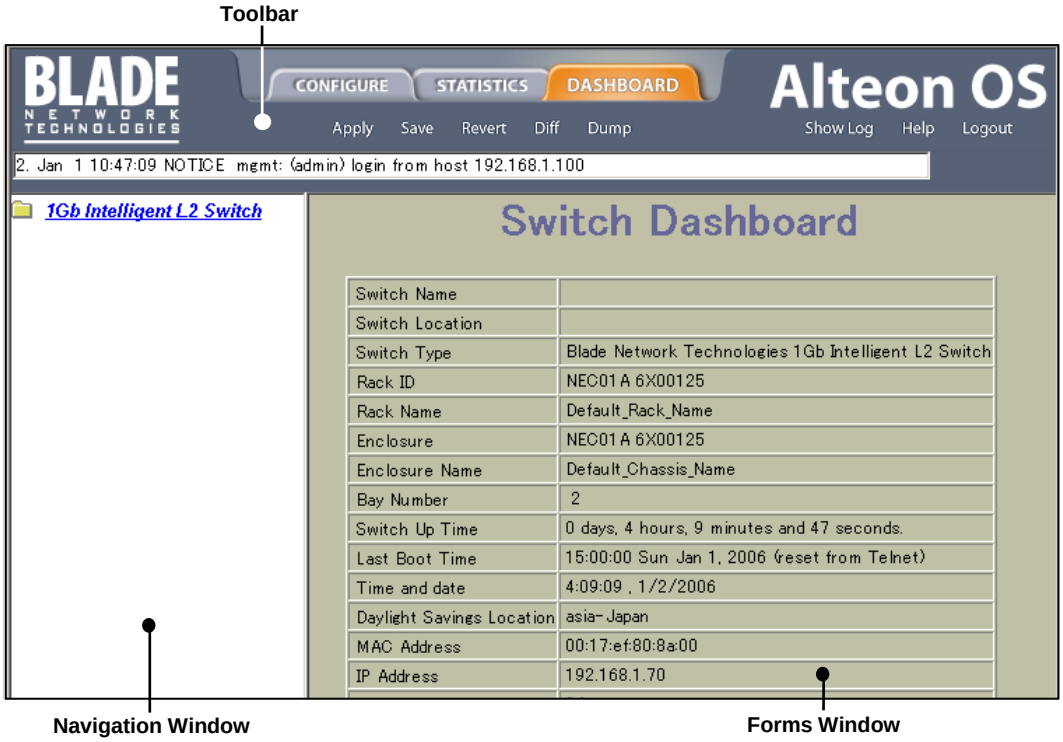

http://192.168.3.70/ - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address http://192.168.3.70:8080
Go Links
BLADE NETWORK TECHNOLOGIES
CONFIGURE STATISTICS DASHBOARD
Alteon OS
Apply Save Revert Diff Dump
Show Log Help Logout
16. Jan 2 5:36:52 NOTICE mgmt: (admin) login from host 192.168.1.100
1Gb Intelligent L2 Switch
Switch Dashboard
Switch Name
Switch Location
Switch Type Blade Network Technologies 1Gb Intelligent L2 Switch
Rack ID NEC01A 6X00125
Rack Name Default_Rack_Name
Enclosure NEC01A 6X00125
Enclosure Name Default_Chassis_Name
Bay Number 2
Switch Up Time 0 days, 5 hours, 43 minutes and 59 seconds.
Last Boot Time 15:00:00 Sun Jan 1, 2006 (reset from Telnet)
Time and date 5:43:21 , 1/2/2006
Daylight Savings Location asia-Japan
MAC Address 00:17:ef:80:8a:00
IP Address 192.168.3.70
Hardware Revision 0A
Switch Serial No MY3644050F
Hardware Part No
HW Spare Part No 856-126690-001-A
Software Rev 0.0.0 (FLASH image2)
Banner
Open folder
Trusted sites

NOTE: There may be a slight delay while the Dashboard page is initializing. You should not stop the browser while loading is in progress. When loading is complete, a folder icon for the switch displays in the left-hand BBI window. Click this folder and a tree of folders displays.

Browser-based interface basics

Introduction

Once you are properly logged in, the switch BBI displays in the Web browser-viewing window.



There are three main regions on the screen.

- The Toolbar is used for selecting the context for your actions in the other windows.
- The Navigation window is used for selecting particular items or features to act upon.
- The Forms window is used for viewing or altering switch information.

Toolbar

The toolbar contains buttons and commands used to access and execute switch functions.

Context buttons

The toolbar is used for setting the context for your actions in the application. There are three context buttons:

Table 1 Context buttons

Button	Description
Configure	When selected, you can access and alter the switch configuration forms. Select an item in the navigation window to display the desired configuration form in the forms window. Note: This context is only available when you are logged in as an administrator.
Statistics	When selected, you can view information about switch performance. Select an item in the navigation window to display the desired statistics in the forms window.
Dashboard	This context button is selected by default when the BBI is first activated. When selected, basic switch information and status can be viewed in the forms window. Select an item in the navigation window to display the desired dashboard information in the forms window.

First click a context button, and then click an item in the navigation window. When a context button is selected, the button is highlighted as a reminder of the current context mode.

Commands

The following general commands are available on the toolbar:

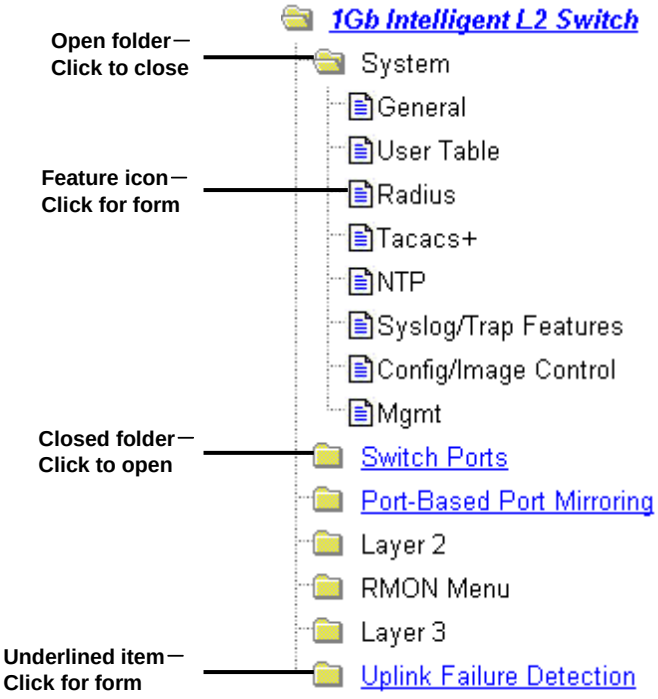
Table 2 Toolbar commands

Command	Description
Apply	Pending configuration changes do not take effect until you select the Apply command. Once applied, all changes (except enabling/disabling Spanning Tree Protocol) take effect on the switch immediately. If you do not save the changes, however, they will be lost the next time the switch is rebooted.
Save	Writes applied configuration changes to flash memory on the switch (with the option of not overlaying the current backup).
Revert	Removes pending configuration changes between Apply commands. Use this command to restore configuration parameters set since last Apply command.
Diff	Shows any pending configuration changes.
Dump	Writes current switch configuration to the screen. Configuration information is displayed with parameters that have been changed from default values.
Show Log	Opens a new Web-browser window for displaying the 100 most recent switch log messages. Close the log browser when finished.
Help	Opens a new Web-browser window for displaying the basic online help information. Close the help browser when finished.
Logout	Logs off the switch and exits the BBI.

Navigation window

The navigation window is used for selecting a particular switch feature to act upon. Status, statistics, or configuration forms for the selected item will display in the forms window, depending on the context chosen on the toolbar.

The navigation window contains a tree of folders, subfolders, and feature icons.



Click any closed folder to open it and reveal its contents. Click any open folder to close it. Click any feature icon to load the appropriate status, statistics, or configuration form in the forms window.

Some folders also have forms. If the name of a folder is underlined, click the name to display the appropriate form.

Forms window

When a feature icon is selected on the navigation window, a status, statistics, or configuration form is displayed in the forms window. The exact nature of the form depends on the current context selected on the toolbar, as well as the type of information available. Not all feature icons have forms for all contexts.

Some forms display switch information such as settings, status, or statistics. Others allow you to make configuration changes to switch parameters.

NOTE: Some items display blank forms, depending on the context. A blank form indicates that no information or actions are available in that context.

Dashboard

Introduction

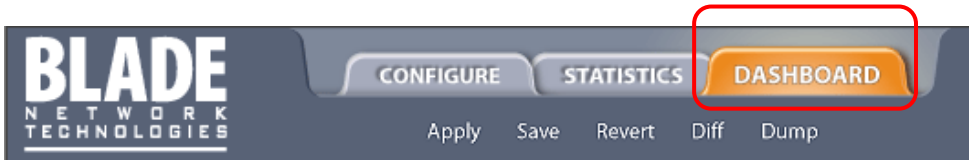
The switch BBI can be used to view the present settings and operating status of a variety of switch features. Most of the same information available through the switch's command line interface is present on the dashboard forms.

The following provides a basic outline for viewing the dashboard forms. You should first be familiar with configuration as covered in the *Command Reference Guide*.

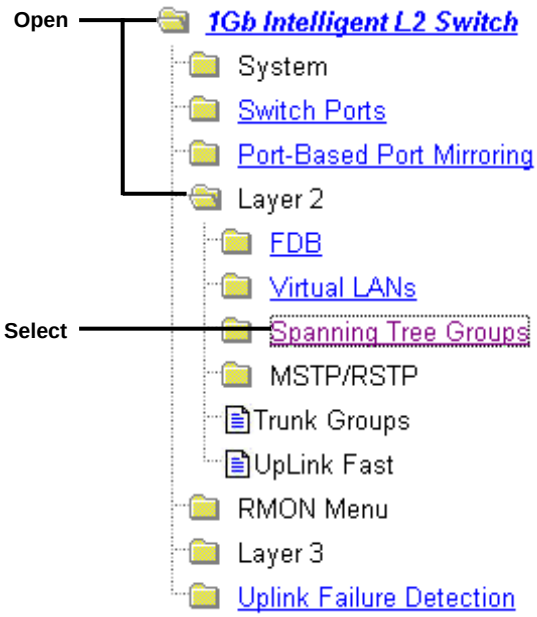
Steps for displaying dashboards

Follow these basic steps for viewing switch dashboard forms.

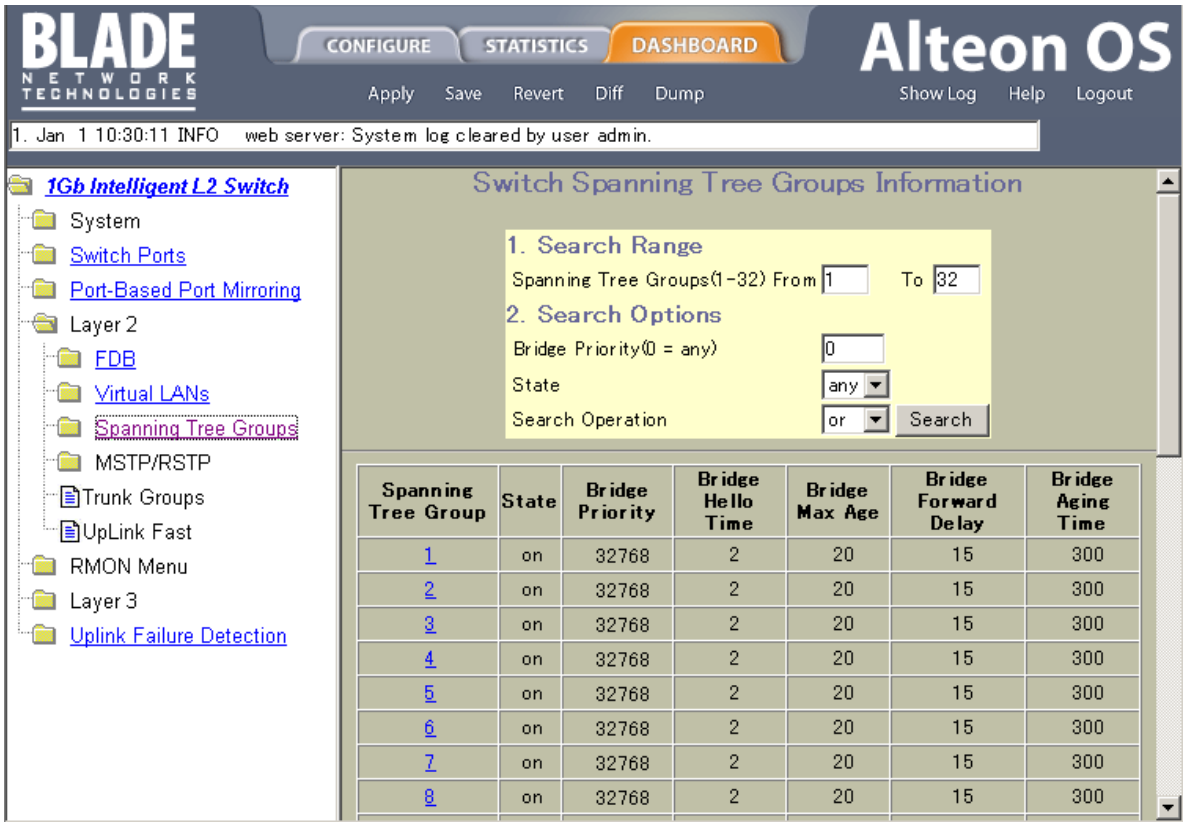
1. Select the Dashboard context button in the BBI toolbar.



2. Select a feature icon in the navigation window. For example, select Spanning Tree Groups:

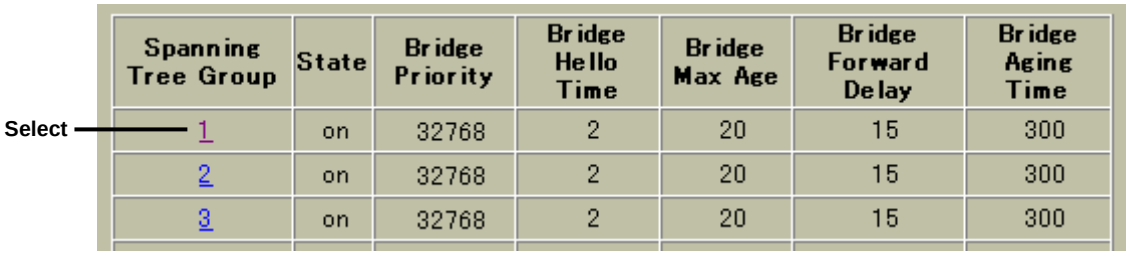


3. View information shown in the forms window.

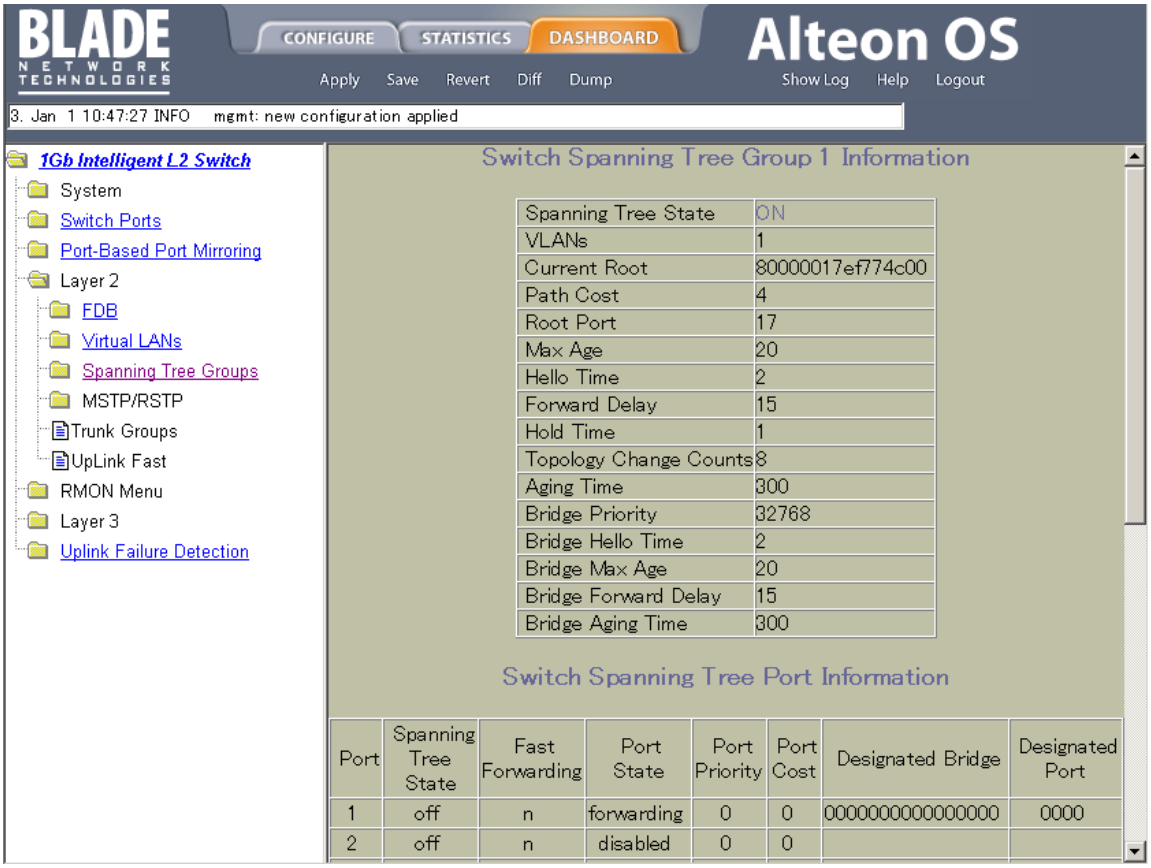


NOTE: Items that load other forms when selected are underlined.

4. Select an underlined item to view details or perform actions.

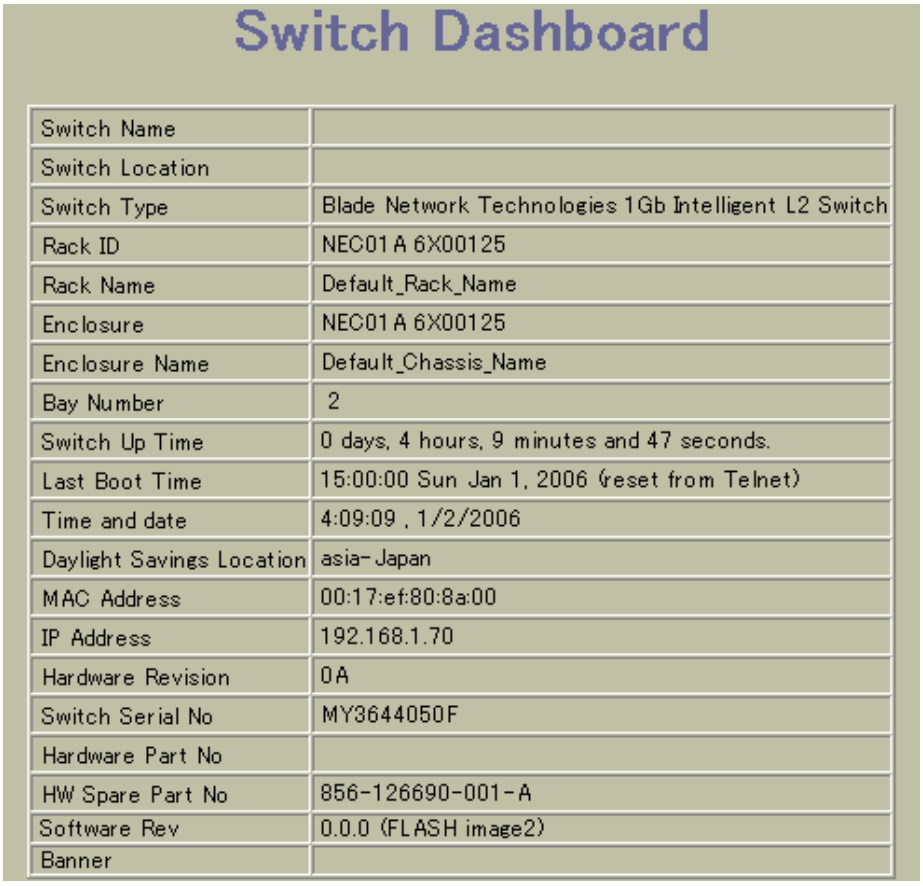


In this example, click a Spanning Tree Group number to view detailed information about the group (shown in form below).



Switch Dashboard

To display the following form, select System > General. This is the default form for the switch.



The following table describes the Switch Dashboard controls:

Table 3 Switch Dashboard controls

Control	Description
Switch Name	Displays the name of the switch, as entered in Configuration > Switch > General (SNMP).
Switch Location	Displays the location of the switch, as entered in Configuration > Switch > General (SNMP).
Switch Type	Displays the type of switch.
Rack ID	Displays the serial number of the rack in which the switch resides.
Rack Name	Displays the name of the rack in which the switch resides.
Enclosure	Displays the serial number of the enclosure in which the switch resides.
Enclosure Name	Displays the name of number of the enclosure in which the switch resides.
Bay Number	Displays the bay number in which the switch resides.
Switch Up Time	Displays the amount of time the switch has been running.
Last Boot Time	Displays the date and time of last switch boot.
Time and date	Displays the current time and date.
Daylight Savings Location	Displays the time zone where the switch resides.
Daylight Savings Time Status	Displays the status of the daylight savings: enabled or disabled
MAC Address	Displays the MAC Address of the switch management processor.
IP Address	Displays the IP address of IP Interface.
Hardware Revision	Displays the hardware revision number of the switch.
Switch Serial No	Displays the serial number of the switch.
Hardware Part No	Not in use.
HW Spare Part No	Displays the part number of spare switch hardware.
Software Rev	Displays the software revision number.
Banner	Displays the login banner text. When a user or administrator logs into the switch, the login banner is displayed. It is also displayed as part of the output from the `/info/sys/gen` command.

User Access Dashboard

To display the following form, select System > User Table.

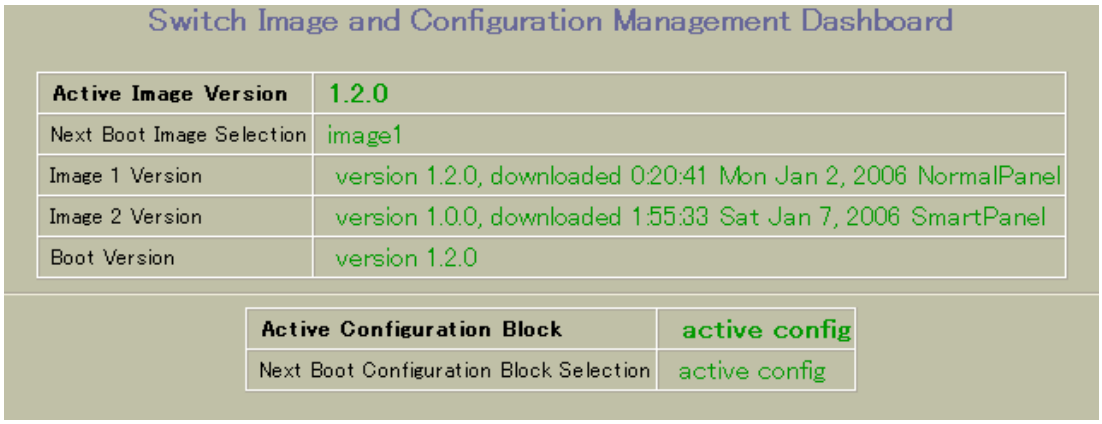
The following table describes the User Access Dashboard controls:

Table 4 User Access Dashboard controls

Control	Description
User ID	Displays the numeric identifier for the user
User Name	Displays the name of the user.
COS	Displays the Class of Service level for the user.
Password	Indicates whether a valid password is defined for the user.
Status	Displays whether the user is enabled or disabled.
Login	Displays the login status of the user (online or offline).

Switch Image and Configuration Management Dashboard

To display the following form, select System > Config/Image Control.



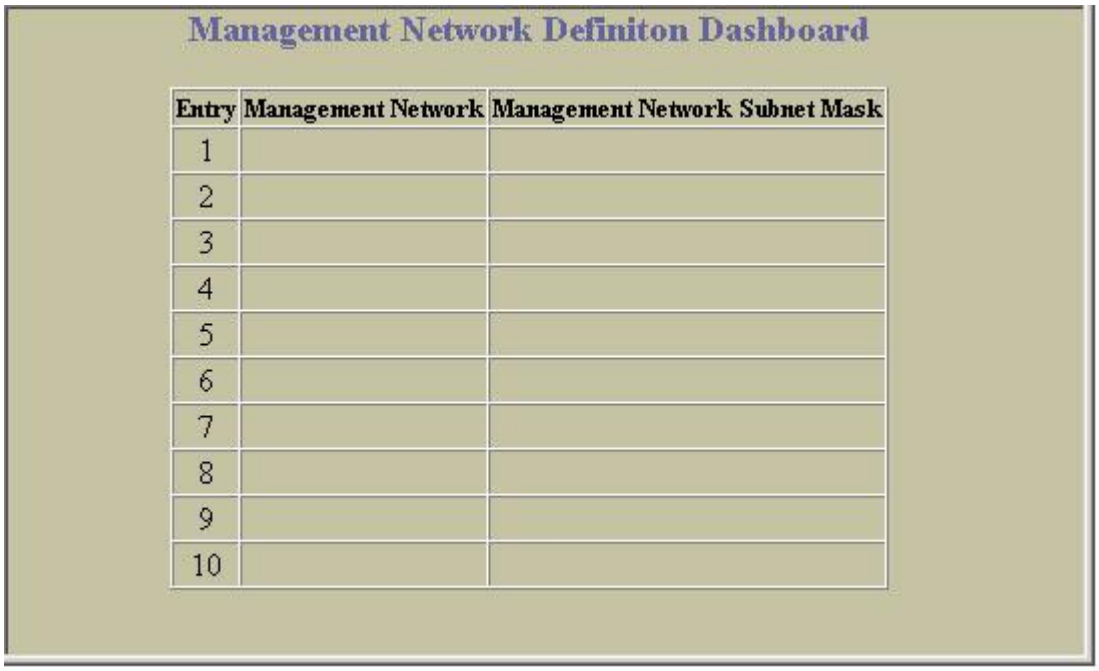
The following table describes the Switch Image and Configuration Dashboard controls:

Table 5 Switch Image and Configuration Dashboard controls

Control	Description
Active Image Version	Displays the number of the active software image.
Next Boot Image Selection	Displays which software image (image1 or image2) will be loaded into switch memory for the next reboot.
Image 1 Version	Displays information about the current Image 1 software. NormalPanel is shown that the software for the Layer2 switch mode is stored in the image.
Image 2 Version	Displays information about the current Image 2 software. SmartPanel is shown that the software for the SmartPanel mode is stored in the image.
Boot Version	Displays the version number of the current Boot software.
Active Configuration Block	Defines which configuration block is selected for the currently running session.
Next Boot Configuration Block Selection	Allows the user to select the configuration block to be loaded upon the next reboot.

Management Network Definition Dashboard

To display the following form, select System > Mgmt.



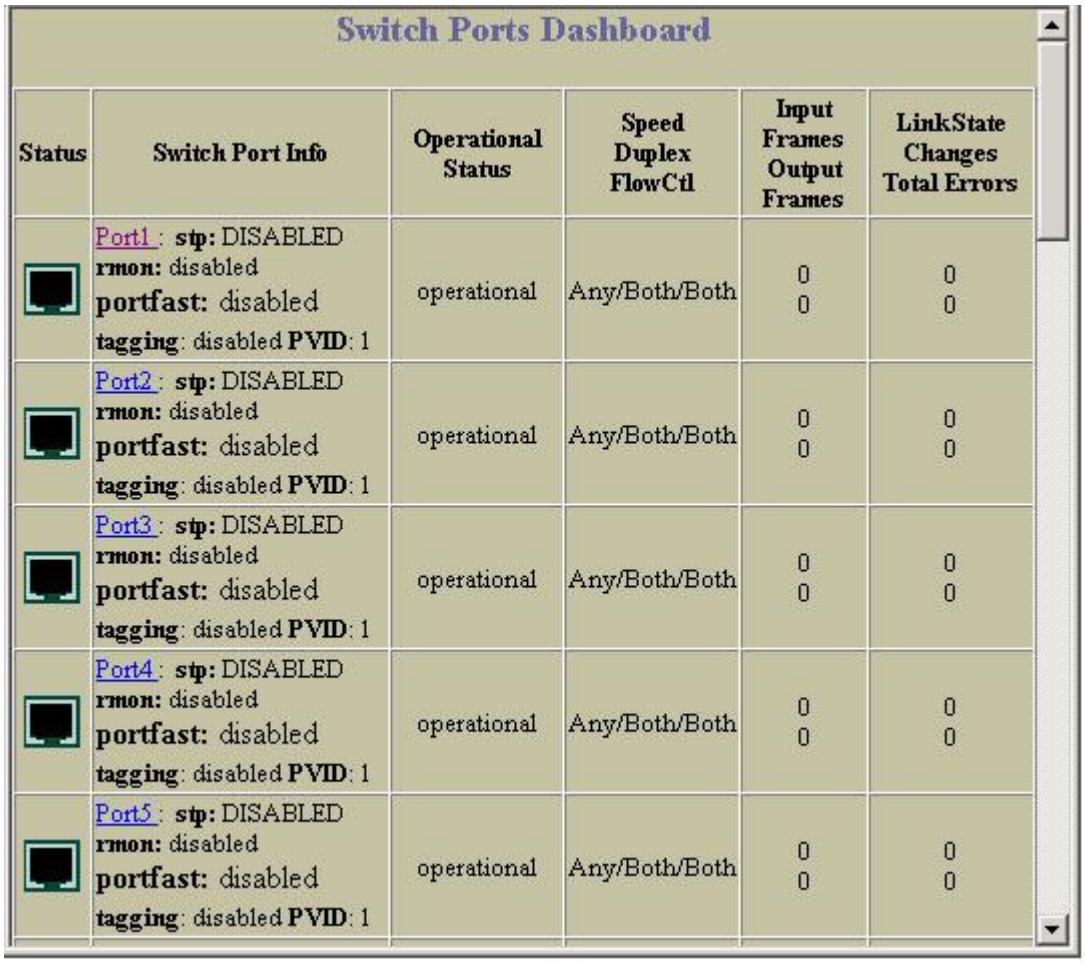
The following table describes the Management Network Definition Dashboard controls:

Table 6 Management Network Definition Dashboard controls

Control	Description
Entry	Displays the entry number for each management network.
Management Network	Displays the IP address of the management network.
Management Network Subnet Mask	Displays the subnet mask of the management network.

Switch Ports Dashboard

To display the following form, select Switch Ports (click the underlined text, not the folder).



Switch Ports Dashboard

Status	Switch Port Info	Operational Status	Speed Duplex FlowCtl	Input Frames Output Frames	LinkState Changes Total Errors
	Port1 : **stp:** DISABLED **rmon:** disabled **portfast:** disabled **tagging**: disabled **PVID**: 1	operational	Any/Both/Both	0 0	0 0
	Port2 : **stp:** DISABLED **rmon:** disabled **portfast:** disabled **tagging**: disabled **PVID**: 1	operational	Any/Both/Both	0 0	0 0
	Port3 : **stp:** DISABLED **rmon:** disabled **portfast:** disabled **tagging**: disabled **PVID**: 1	operational	Any/Both/Both	0 0	0 0
	Port4 : **stp:** DISABLED **rmon:** disabled **portfast:** disabled **tagging**: disabled **PVID**: 1	operational	Any/Both/Both	0 0	0 0
	Port5 : **stp:** DISABLED **rmon:** disabled **portfast:** disabled **tagging**: disabled **PVID**: 1	operational	Any/Both/Both	0 0	0 0

The following table describes the Switch Ports Dashboard controls:

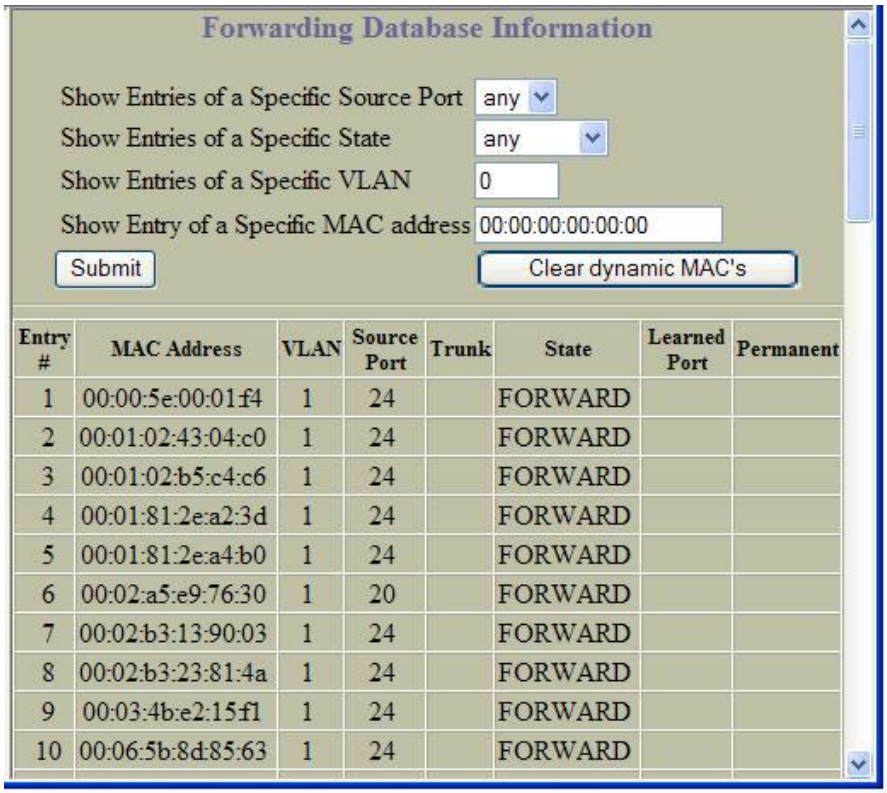
Table 7 Switch Ports Dashboard controls

Control	Description
Status	Shows if the port is enabled (green) or disabled (black).
Switch Port Info	Summarizes the following port information: STP: Shows if the port has Spanning Tree Protocol enabled or disabled. rmon: Shows if RMON is enabled or disabled. portfast: Shows if Port Fast Forwarding is enabled or disabled. tagging: Shows if this port has VLAN Tagging enabled or disabled. PVID: VLAN ID of any VLAN(s) to which this port is a member.
Operational Status	Displays the operational status of the port.
Speed/Duplex/Flow Ctl	Displays parameters for the port link.
Input Frames/Output Frames	Displays the number of frames that have been received by this port (Input Frames) and the number of frames that have been transmitted by this port (Output Frames).
Link State Changes/Total Errors	Displays the total number of link state changes for this port and the total number of errors logged by this port.

For more information, select a port number to display detailed statistics for that port.

Forwarding Database Information

To display the following form, select Layer 2 > FDB.



Entry #	MAC Address	VLAN	Source Port	Trunk	State	Learned Port	Permanent
1	00:00:5e:00:01:f4	1	24		FORWARD		
2	00:01:02:43:04:c0	1	24		FORWARD		
3	00:01:02:b5:c4:c6	1	24		FORWARD		
4	00:01:81:2e:a2:3d	1	24		FORWARD		
5	00:01:81:2e:a4:b0	1	24		FORWARD		
6	00:02:a5:e9:76:30	1	20		FORWARD		
7	00:02:b3:13:90:03	1	24		FORWARD		
8	00:02:b3:23:81:4a	1	24		FORWARD		
9	00:03:4b:e2:15:f1	1	24		FORWARD		
10	00:06:5b:8d:85:63	1	24		FORWARD		

The forwarding database (FDB) contains information that maps the media access control (MAC) address of each known device to the switch port where the device address was learned. The FDB also shows which other ports have seen frames destined for a particular MAC address.

NOTE: The master forwarding database supports up to 8K MAC address entries on the MP per switch.

The following table describes the Forwarding Database Information controls:

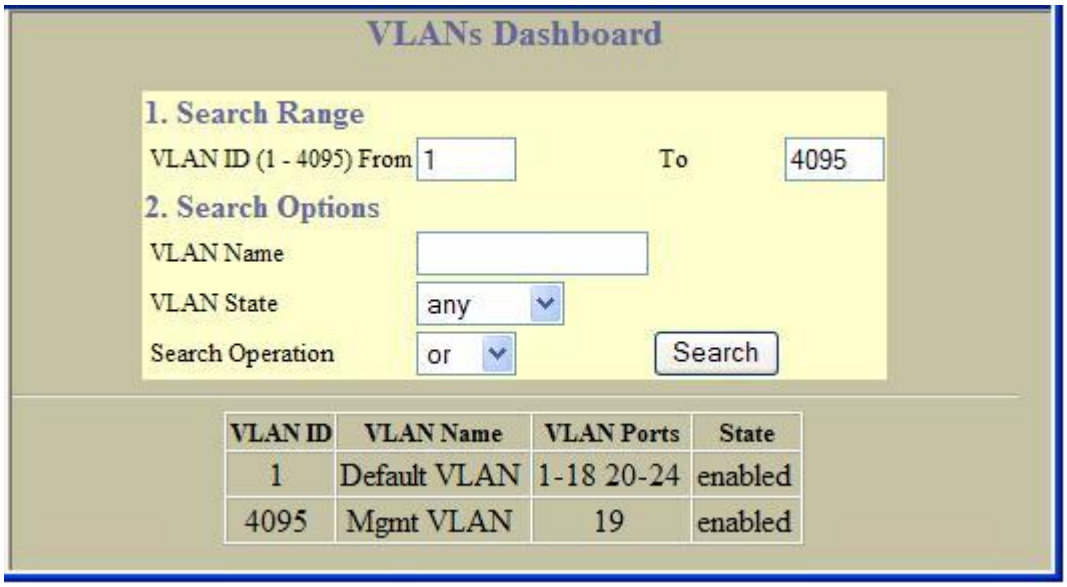
Table 8 Forwarding Database Information controls

Control	Description
Show Entries of a Specific Source Port	Displays FDB entries for the selected port(s).
Show Entries of a Specific State	Displays FDB entries by state.
Show Entries of a Specific VLAN	Displays FDB entries for the selected VLAN.
Show Entry of a Specific MAC address	Displays a single FDB entry by IP address. Enter the MAC address using the format, `xx:xx:xx:xx:xx:xx`. For example, `08:00:20:12:34:56`
Clear Dynamic MACs	Removes learned FDB entries.
Entry #	Displays the numeric identifier of the FDB entry.
MAC Address	Displays the MAC address of the FDB entry.
VLAN	Displays the VLAN number of the FDB entry.
Source Port	Displays the source port of the FDB entry.
Trunk	Displays the trunk number of the FDB entry, if applicable.
State	Displays the port state of the FDB entry.
Learned Port	Displays the port number of the port that received the FDB entry.
Permanent	Displays whether the FDB entry is a static, permanent entry.

An address that is in the forwarding (`FORWARD`) state means that the switch has learned it. When in the trunking (`TRUNK`) state, the port field represents the trunk group number. If the state for the port is listed as unknown (`UNKNOWN`), the MAC address has not yet been learned by the switch, but has only been seen as a destination address. When an address is in the unknown state, no outbound port is indicated.

VLANs Dashboard

To display the following form, select Layer 2 > Virtual LANs (click the underlined text, not the folder).



This form displays information for all configured VLANs and all member ports that have an active link state.

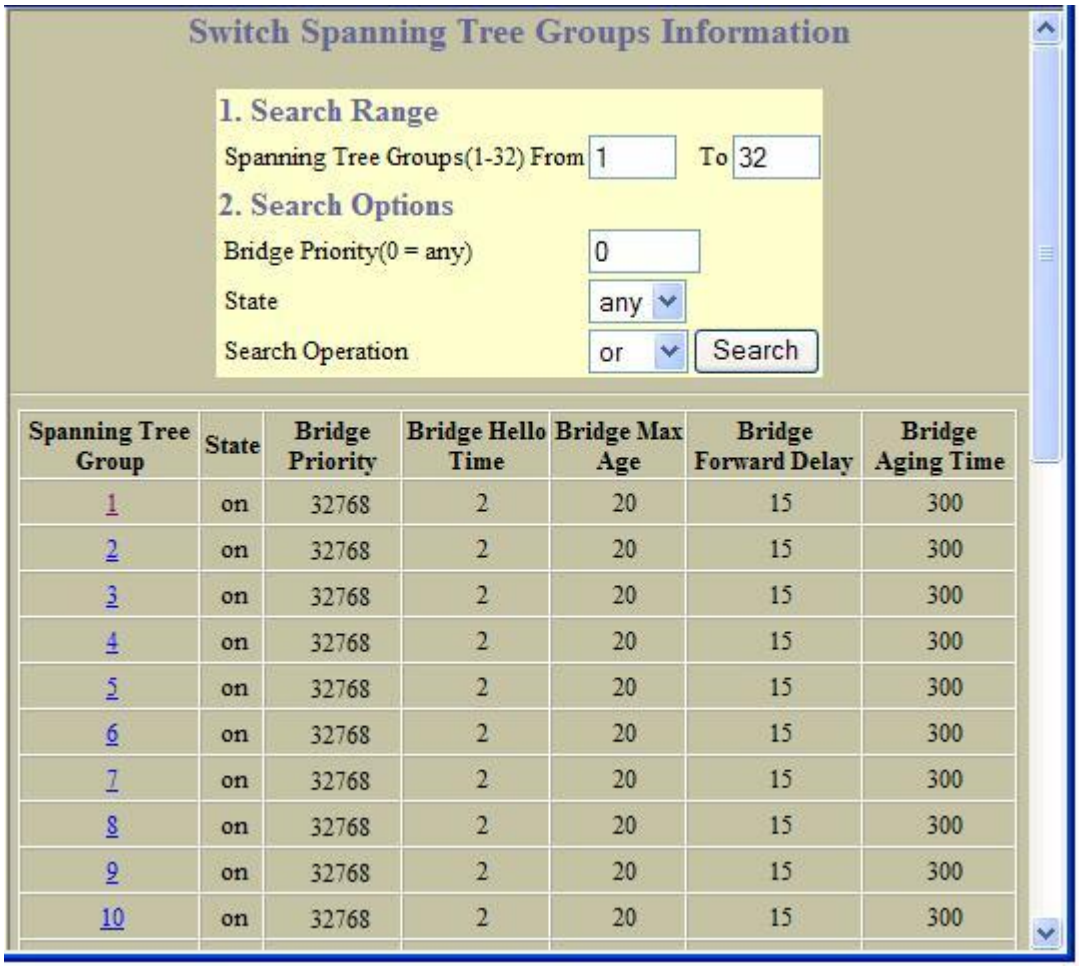
The following table describes the VLANs Dashboard controls:

Table 9 VLANs Dashboard controls

Control	Description
Search Range	To search for a VLAN, enter a range of VLAN numbers in the From and To fields.
Search Options	To focus the search for a VLAN, enter optional search parameters: • VLAN Name • VLAN State Fields that have a value of “any” are ignored during the search. Choose a search operation: • or: Search for VLANS specified in the search range that meet any of the criteria entered. • and: Search for VLANS specified in the search range that meet all of the criteria entered. Click Search to display VLANS that fit the range and meet the criteria entered.
VLAN ID	Displays the numeric identifier of the VLAN.
VLAN Name	Displays the name of the VLAN.
VLAN Ports	Displays the port numbers of ports that are members of the VLAN.
State	Shows if the VLAN is enabled or disabled.

Switch Spanning Tree Groups Information

To display the following form, select Layer 2 > Spanning Tree Groups (click the underlined text, not the folder).


Switch Spanning Tree Groups Information
1. Search Range
Spanning Tree Groups(1-32) From 1 To 32
2. Search Options
Bridge Priority(0 = any) 0
State any
Search Operation or Search
Spanning Tree Group | State | Bridge Priority | Bridge Hello Time | Bridge Max Age | Bridge Forward Delay | Bridge Aging Time
1 on 32768 2 20 15 300
2 on 32768 2 20 15 300
3 on 32768 2 20 15 300
4 on 32768 2 20 15 300
5 on 32768 2 20 15 300
6 on 32768 2 20 15 300
7 on 32768 2 20 15 300
8 on 32768 2 20 15 300
9 on 32768 2 20 15 300
10 on 32768 2 20 15 300

The following table describes the Switch Spanning Tree Groups Information controls:

Table 10 Switch Spanning Tree Groups Information controls

Control	Description
Search Range	To search for a Spanning Tree Group, enter a range of group numbers in the From and To fields.
Search Options	To focus the search for a Spanning Tree Group, enter optional search parameters: • Bridge Priority • Spanning Tree State Fields that have a value of “any” are ignored during the search. Choose a search operation: • or: Search for spanning tree groups specified in the search range that meet any of the criteria entered. • and: Search for spanning tree groups specified in the search range that meet all of the criteria entered. Click Search to display spanning tree groups that fit the range and meet the criteria entered.
Spanning Tree Group	Displays the numeric identifier of the Spanning Tree Group.
State	Shows if Spanning Tree is turned on or off for the port.
Bridge Priority	Controls which bridge on the network will become the STP root bridge. This command does not apply to MSTP.
Bridge Hello Time	Specifies, in seconds, how often the root bridge transmits a configuration bridge protocol data unit (BPDU). Any bridge that is not the root bridge uses the root bridge hello value. This command does not apply to MSTP.
Bridge Max Age	Specifies, in seconds, the maximum time the bridge waits without receiving a configuration bridge protocol data unit before it reconfigures the STP network. This command does not apply to MSTP.

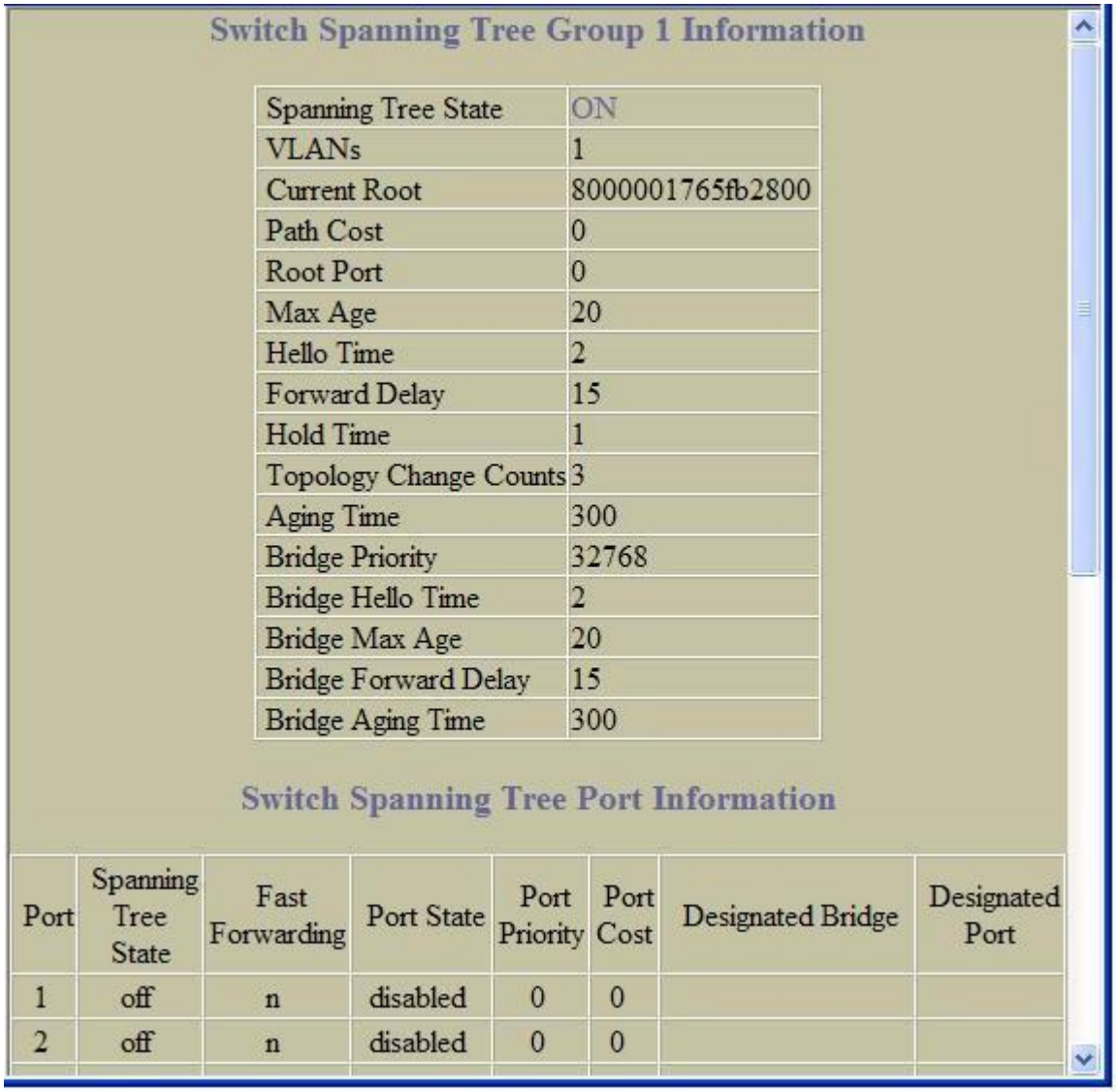
Table 10 Switch Spanning Tree Groups Information controls

Control	Description
Bridge Forward Delay	Specifies, in seconds, the amount of time that a bridge port has to wait before it changes from learning state to forwarding state. This command does not apply to MSTP.
Bridge Aging Time	Specifies, in seconds, the amount of time the bridge waits without receiving a packet from a station before removing the station from the Forwarding Database.

Select a Spanning Tree Group number to display detailed information.

Switch Spanning Tree Group Information

To display the following form, go to the Switch Spanning Tree Groups Information form. Select a Spanning Tree Group number.



Switch Spanning Tree Group 1 Information

Spanning Tree State	ON
VLANs	1
Current Root	8000001765fb2800
Path Cost	0
Root Port	0
Max Age	20
Hello Time	2
Forward Delay	15
Hold Time	1
Topology Change Counts	3
Aging Time	300
Bridge Priority	32768
Bridge Hello Time	2
Bridge Max Age	20
Bridge Forward Delay	15
Bridge Aging Time	300

Switch Spanning Tree Port Information

Port	Spanning Tree State	Fast Forwarding	Port State	Port Priority	Port Cost	Designated Bridge	Designated Port
1	off	n	disabled	0	0		
2	off	n	disabled	0	0		

The following table describes the Switch Spanning Tree Group Information controls:

Table 11 Switch Spanning Tree Group Information controls

Control	Description
Spanning Tree State	Shows if Spanning Tree is turned on or off for the switch.
VLANs	Displays the VLANs that are members of this Spanning Tree Group.
Current Root	Displays information about the root bridge for the Spanning Tree. Information includes the priority (hex) and MAC address of the root.
Path Cost	Displays the cumulative path cost to the Current Root.
Root Port	Displays the switch port that is connected to the Current Root.
Max Age	Specifies, in seconds, the maximum time the bridge waits without receiving a configuration bridge protocol data unit before it reconfigures the STP network.
Hello Time	Specifies, in seconds, how often the root bridge transmits a configuration bridge protocol data unit (BPDU). Any bridge that is not the root bridge uses the root bridge hello value.
Forward Delay	Specifies, in seconds, the amount of time that a bridge port has to wait before it changes from learning state to forwarding state.
Hold Time	Displays the minimum number of seconds that must elapse between transmissions of consecutive configuration BPDUs on a port.
Topology Change Counts	Displays the number of times the spanning tree topology has changed.
Aging Time	Specifies, in seconds, the amount of time the bridge waits without receiving a packet from a station before removing the station from the Forwarding Database.
Bridge Priority	Controls which bridge on the network will become the STP root bridge.
Bridge Hello Time	Specifies, in seconds, how often the root bridge transmits a configuration bridge protocol data unit (BPDU). Any bridge that is not the root bridge uses the root bridge hello value.
Bridge Max Age	Specifies, in seconds, the maximum time the bridge waits without receiving a configuration bridge protocol data unit before it reconfigures the STP network.
Bridge Forward Delay	Specifies, in seconds, the amount of time that a bridge port has to wait before it changes from learning state to forwarding state.
Bridge Aging Time	Specifies, in seconds, the amount of time the bridge waits without receiving a packet from a station before removing the station from the Forwarding Database.

Switch Spanning Tree Port Information

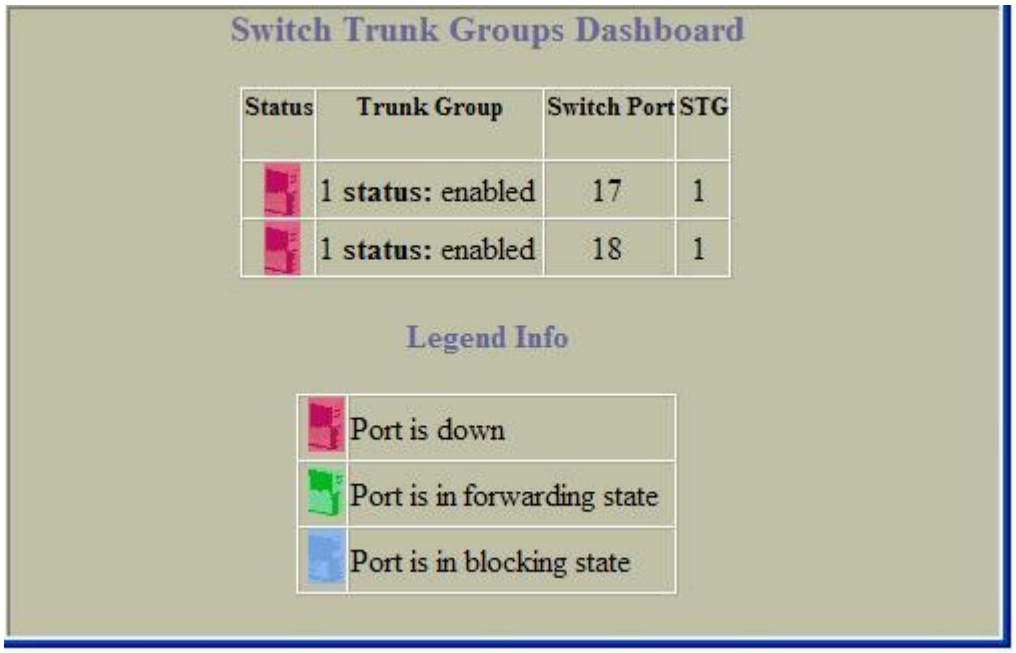
The following table describes the STP port parameters:

Table 12 Switch Spanning Tree Port Information controls

Control	Description
Port	Displays the port number for each port's STP information.
Spanning Tree State	Shows if Spanning Tree is turned on or off for the port.
Port State	Shows the current state of the port. The state field can be `blocking`, `listening`, `learning`, `forwarding`, or `disabled`. The State field in RSTP or MSTP mode can be one of the following: `Discarding (DISC), Learning (LRN), Forwarding (FWD), or Disabled (DSB).`
Port Priority	Helps determine which bridge port becomes the designated port. In a network topology that has multiple bridge ports connected to a single segment, the port with the lowest port priority becomes the designated port for the segment.
Port Cost	Helps determine the designated port for a segment. Generally speaking, the faster the port, the lower the path cost. A setting of 0 indicates that the cost will be set to the appropriate default after the link speed has been auto negotiated.
Designated Bridge	Shows information about the bridge connected to each port, if applicable. Information includes the priority (hex) and MAC address of the Designated Bridge.
Designated Port	Displays the port ID of the port on the Designated Bridge to which this port is connected.

Switch Trunk Groups Dashboard

To display the following form, select Layer 2 > Trunk Groups.



When trunk groups are configured, you can view the state of each port in the various trunk groups.

NOTE: If Spanning Tree Protocol on any port in the trunk group is set to `forwarding`, the remaining ports in the trunk group will also be set to `forwarding`.

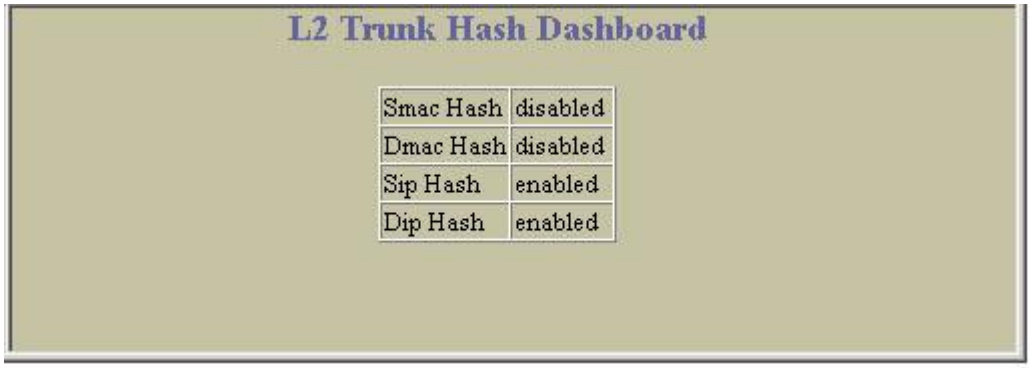
The following table describes the Switch Trunk Groups Dashboard controls:

Table 13 Switch Trunk Groups Dashboard controls

Control	Description
Status	For each port in the Trunk Group, shows whether the port is down (red), up and forwarding (green) or in blocking state.
Trunk Group	Displays the numeric identifier of the Trunk Group.
Switch Port	Displays the port number of each port that is a member of the Trunk Group.
STG	Displays the Spanning Tree Group to which this trunk belongs.

Trunk Hash Dashboard

To display the following form, select Layer 2 > Trunk Hash.



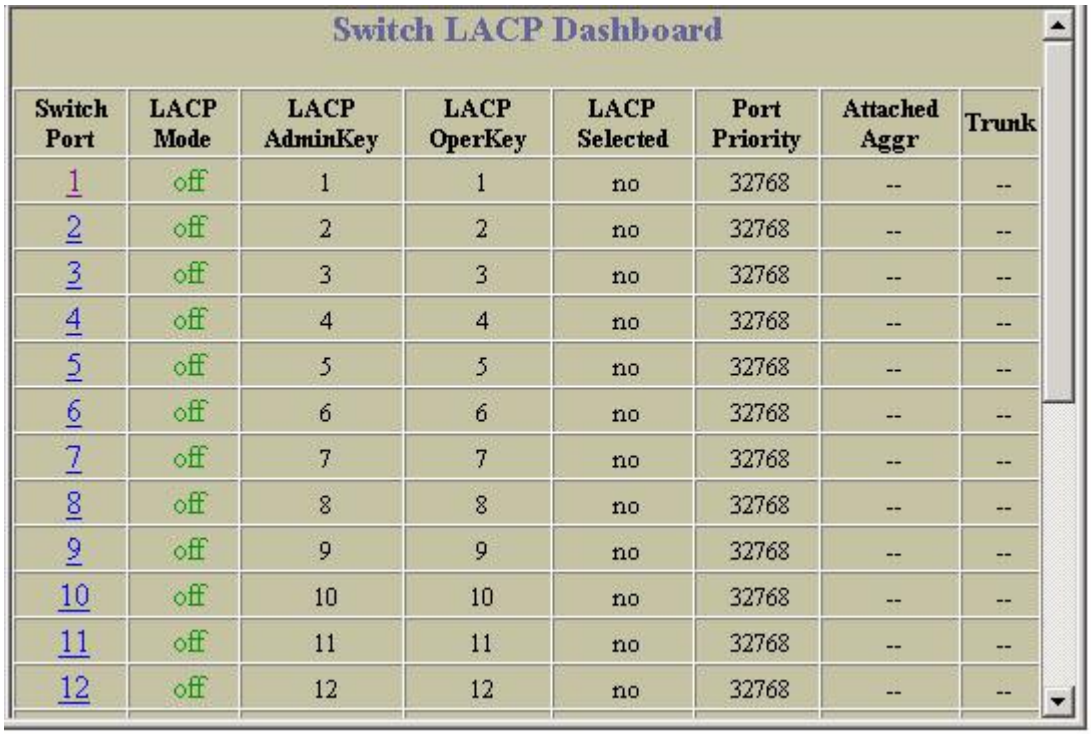
The following table describes the Layer 2 (L2) Trunk Hash Dashboard controls:

Table 14 Trunk Hash Dashboard controls

Control	Description
Smac Hash	Displays the status of the source MAC hash: enabled or disabled.
Dmac Hash	Displays the status of the destination MAC hash: enabled or disabled.
Sip Hash	Displays the status of the source IP hash: enabled or disabled.
Dip Hash	Displays the status of the destination IP hash: enabled or disabled.

LACP Dashboard

To display the following form, select Layer 2 > LACP.


Switch LACP Dashboard
Switch Port
LACP Mode
LACP AdminKey
LACP OperKey
LACP Selected
Port Priority
Attached Aggr
Trunk
1 off 1 1 no 32768 -- --
2 off 2 2 no 32768 -- --
3 off 3 3 no 32768 -- --
4 off 4 4 no 32768 -- --
5 off 5 5 no 32768 -- --
6 off 6 6 no 32768 -- --
7 off 7 7 no 32768 -- --
8 off 8 8 no 32768 -- --
9 off 9 9 no 32768 -- --
10 off 10 10 no 32768 -- --
11 off 11 11 no 32768 -- --
12 off 12 12 no 32768 -- --

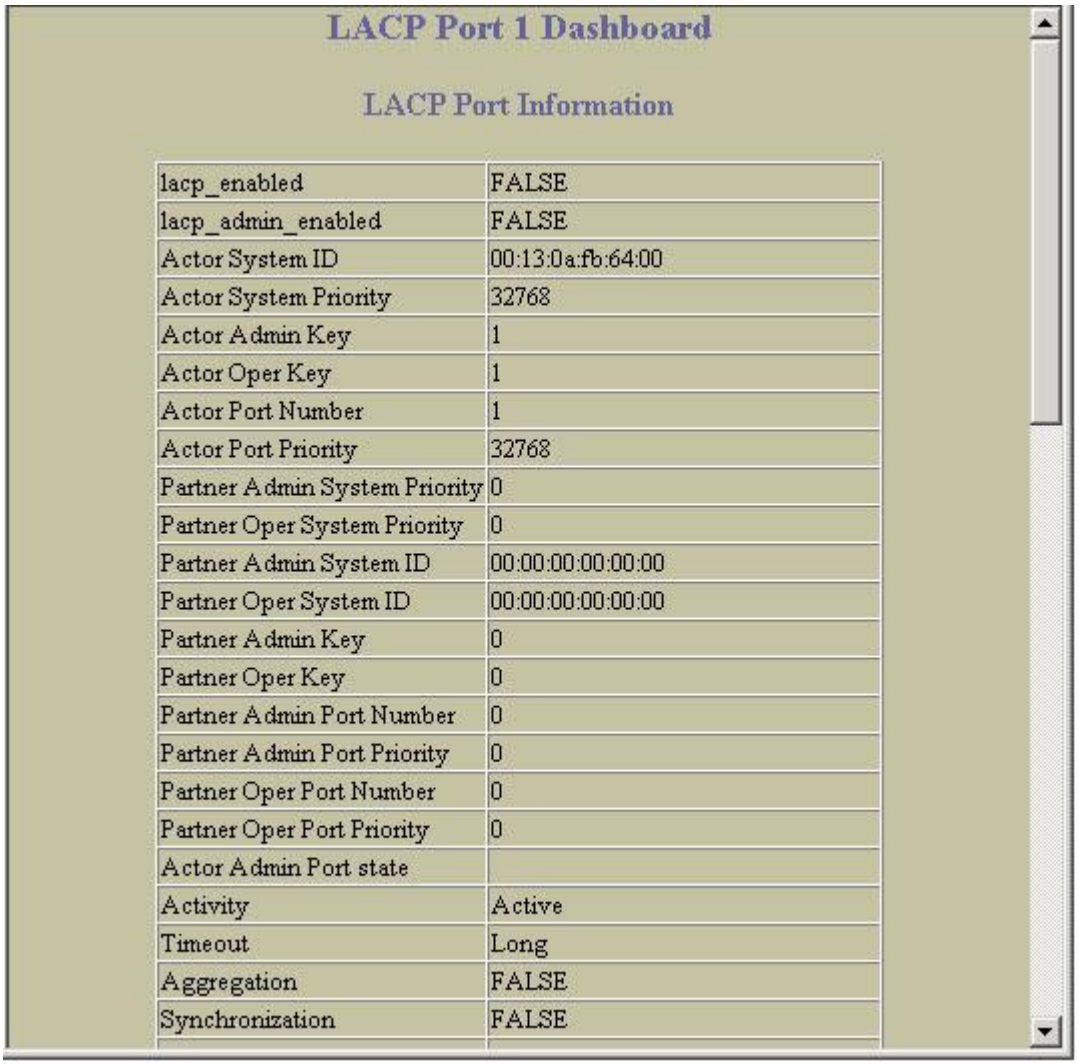
The following table describes the Switch LACP Dashboard controls:

Table 15 LACP Dashboard controls

Control	Description
Switch Port	Displays the port number.
LACP Mode	Displays the port's LACP mode (active, passive, or off).
LACP Adminkey	Displays the value of the port's *adminkey*.
LACP Operkey	Displays the value of the port's *operkey*.
LACP Selected	Indicates whether the port has been selected to be part of a Link Aggregation Group.
Port Priority	Shows the value of the port priority.
Attached Aggr	Displays the aggregator associated with each port.
Trunk	Displays the value that represents the LACP trunk group number.

LACP Port Dashboard

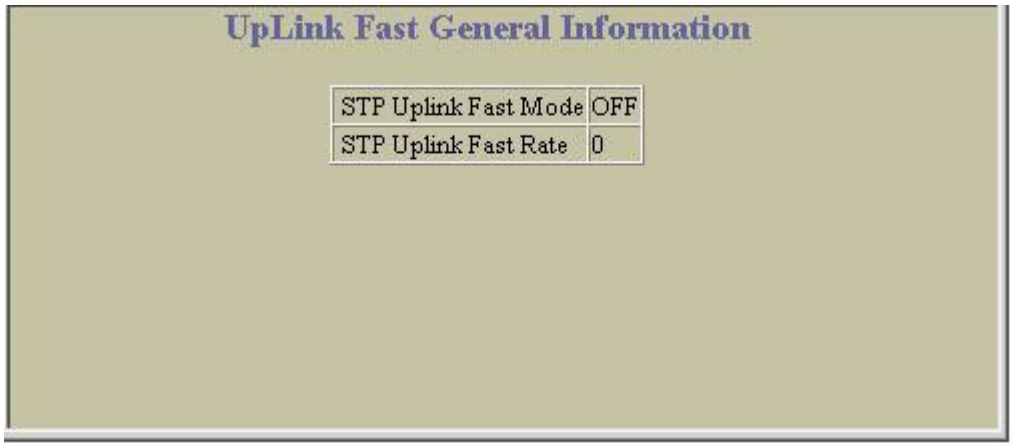
To display the following form, go to the Switch LACP Dashboard. Select a port number.



This form summarizes LACP port information.

Uplink Fast General Information

To display the following form, select Layer 2 > Uplink Fast.



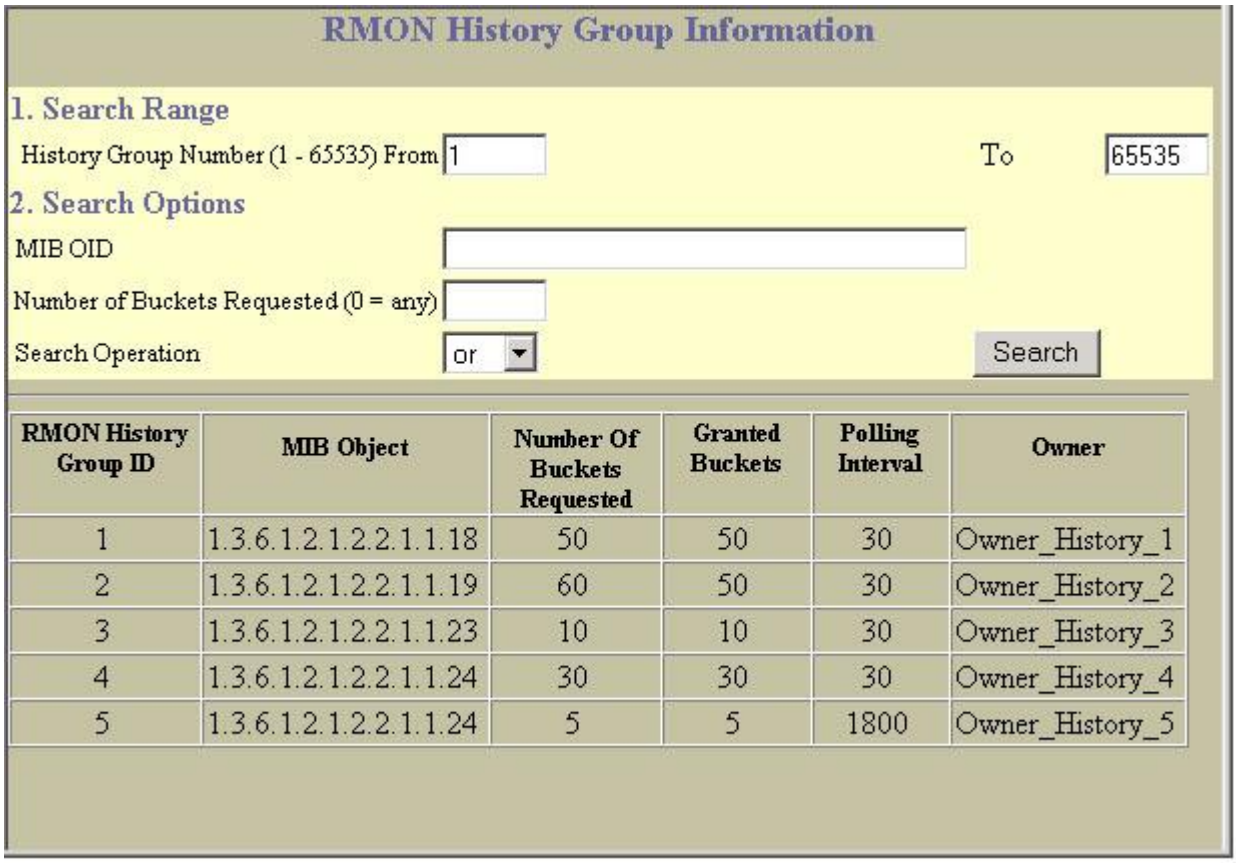
The following table describes the Uplink Fast Information controls:

Table 16 Uplink Fast General Information controls

Control	Description
STP Uplink Fast Mode	Displays the status of STP Uplink Fast: ON or OFF.
STP Uplink Fast Rate	Displays the value of the Uplink Fast station update rate, in seconds.

RMON History Group Information

To display the following form, select RMON > History (click the underlined text, not the folder).



This form displays information for all configured RMON History Groups.

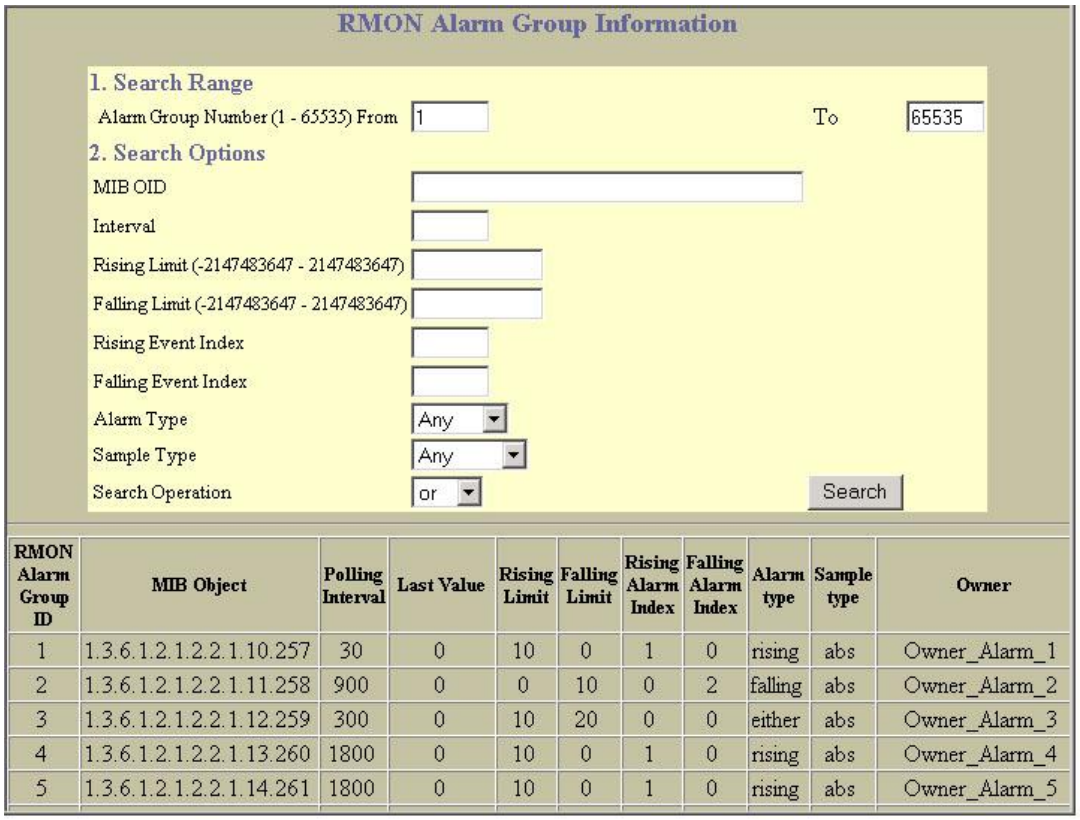
The following table describes the RMON History Group Dashboard controls:

Table 17 RMON History Group Dashboard controls

Control	Description
Search Range	To search for a History Group, enter a range of numbers in the From and To fields.
Search Options	To focus the search for a History Group, enter optional search parameters: • MIB OID • Number of buckets requested Fields that have a value of “any” are ignored during the search. Choose a search operation: • or: Search for History Groups specified in the search range that meet any of the criteria entered. • and: Search for History Groups specified in the search range that meet all of the criteria entered. Click Search to display History Groups that fit the range and meet the criteria entered.
RMON History Group ID	Displays the numeric identifier of the History Group.
MIB Object	Displays the MIB Object Identifier.
Number of Buckets Requested	Displays the number of requested buckets, which is the number of data slots into which data is to be saved.
Granted Buckets	Displays the number of granted buckets that may hold sampled data.
Polling Interval	Displays the time interval for each sampling bucket.
Owner	Displays a text string that identifies the person or entity that created this History Group.

RMON Alarm Group Information

To display the following form, select RMON > Alarm (click the underlined text, not the folder).



RMON Alarm Group ID	MIB Object	Polling Interval	Last Value	Rising Limit	Falling Limit	Rising Alarm Index	Falling Alarm Index	Alarm type	Sample type	Owner
1	1.3.6.1.2.1.2.2.1.10.257	30	0	10	0	1	0	rising	abs	Owner_Alarm_1
2	1.3.6.1.2.1.2.2.1.11.258	900	0	0	10	0	2	falling	abs	Owner_Alarm_2
3	1.3.6.1.2.1.2.2.1.12.259	300	0	10	20	0	0	either	abs	Owner_Alarm_3
4	1.3.6.1.2.1.2.2.1.13.260	1800	0	10	0	1	0	rising	abs	Owner_Alarm_4
5	1.3.6.1.2.1.2.2.1.14.261	1800	0	10	0	1	0	rising	abs	Owner_Alarm_5

This form displays information for all configured RMON Alarm Groups.

The following table describes the RMON Alarm Group Dashboard controls:

Table 18 RMON Alarm Group Dashboard controls

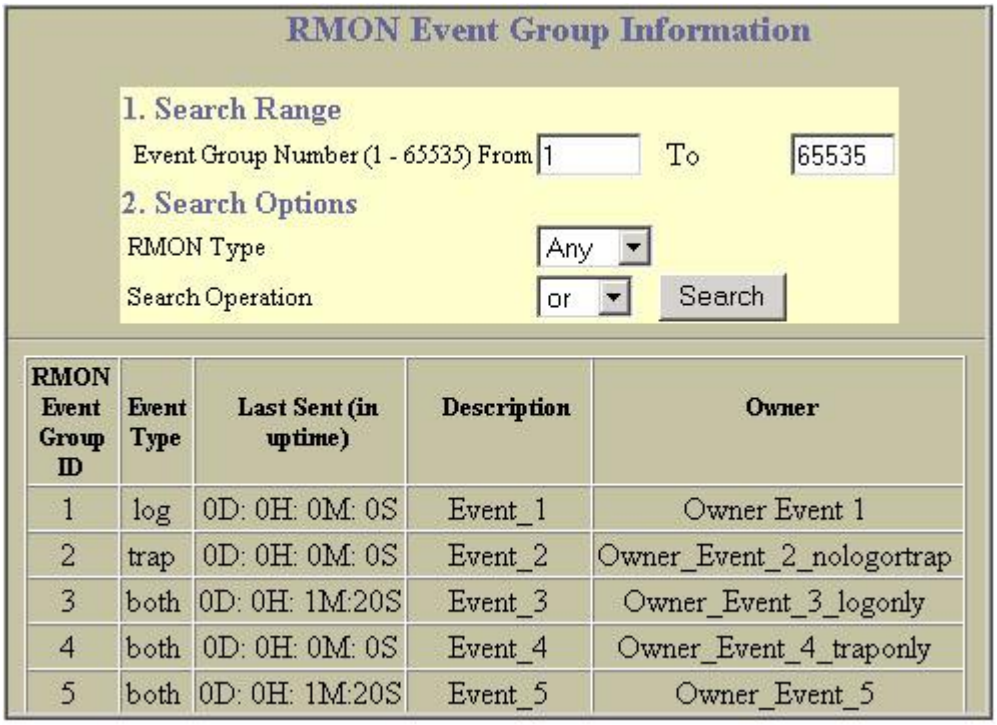
Control	Description
Search Range	To search for a RMON Alarm Group, enter a range of numbers in the From and To fields.
Search Options	To focus the search for a RMON Alarm, enter optional search parameters: • MIB OID • Interval • Rising Limit • Falling Limit • Rising Event Index • Falling Event Index • Alarm Type • Sample Type Fields that have a value of “any” are ignored during the search. Choose a search operation: • or: Search for Alarms specified in the search range that meet any of the criteria entered. • and: Search for Alarms specified in the search range that meet all of the criteria entered. Click Search to display RMON Alarms that fit the range and meet the criteria entered.
RMON Alarm Group ID	Displays the numeric identifier of the Alarm Group.
MIB Object	Displays the MIB Object Identifier.
Polling Interval	Displays the time interval over which data is sampled and compared with the rising and falling thresholds.
Last Value	Displays the most recent value sampled.
Rising Limit	Displays the rising threshold for the sampled statistic.
Falling Limit	Displays the falling threshold for the sampled statistic.
Rising Alarm Index	Displays the rising alarm event index that is triggered when a rising threshold is crossed.
Falling Alarm Index	Displays the falling alarm event index that is triggered when a falling threshold is crossed.
Alarm Type	Displays the alarm type as rising, falling, or either (rising or falling).

Table 18 RMON Alarm Group Dashboard controls

Control	Description
Sample Type	Displays the method of sampling the selected variable and calculating the value to be compared against the thresholds, as follows: • abs: absolute value, the value of the selected variable is compared directly with the thresholds at the end of the sampling interval. • delta: delta value, the value of the selected variable at the last sample is subtracted from the current value, and the difference compared with the thresholds.
Owner	Displays a text string that identifies the person or entity that created this Alarm Group.

RMON Event Group Information

To display the following form, select RMON > Event (click the underlined text, not the folder).


RMON Event Group Information
1. Search Range
Event Group Number (1 - 65535) From 1 To 65535
2. Search Options
RMON Type Any
Search Operation or Search
RMON Event Group ID | Event Type | Last Sent (in uptime) | Description | Owner
1 | log | 0D: 0H: 0M: 0S | Event_1 | Owner Event 1
2 | trap | 0D: 0H: 0M: 0S | Event_2 | Owner_Event_2_nologortrap
3 | both | 0D: 0H: 1M:20S | Event_3 | Owner_Event_3_logonly
4 | both | 0D: 0H: 0M: 0S | Event_4 | Owner_Event_4_traponly
5 | both | 0D: 0H: 1M:20S | Event_5 | Owner_Event_5

This form displays information for all configured RMON Event Groups.

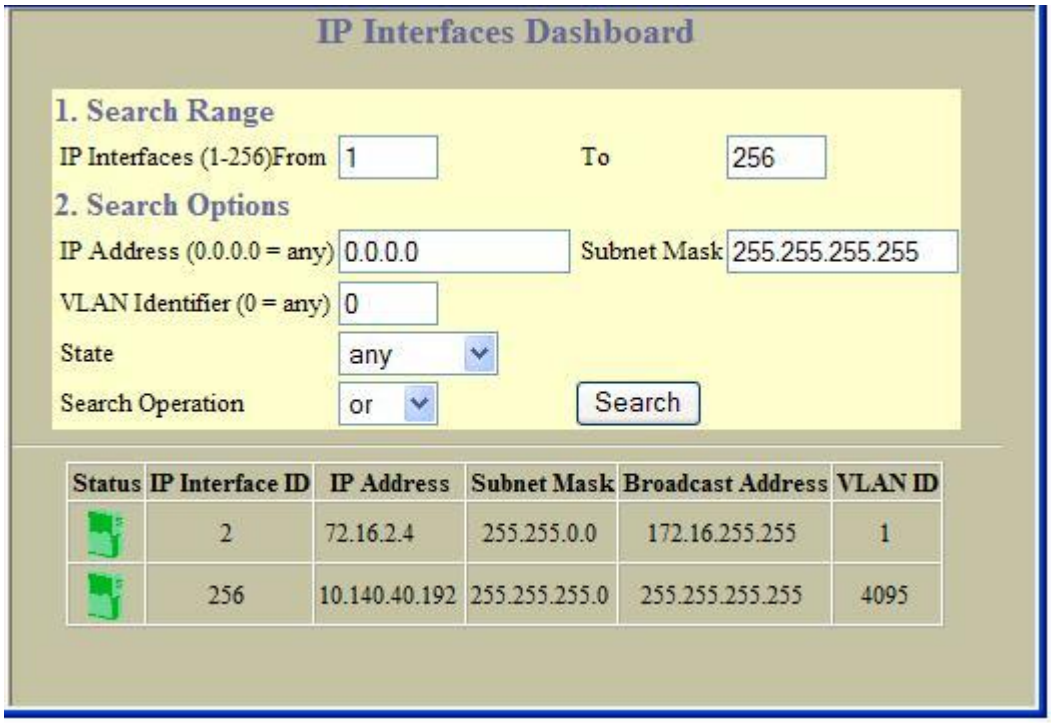
The following table describes the RMON Event Group Dashboard controls:

Table 19 RMON Event Group Dashboard controls

Control	Description
Search Range	To search for a RMON Event Group, enter a range of numbers in the **From** and **To** fields.
Search Options	To focus the search for an Event Group, enter optional search parameters: • RMON Type Fields that have a value of “any” are ignored during the search. Choose a search operation: or: Search for Events specified in the search range that meet any of the criteria entered. and: Search for Events specified in the search range that meet all of the criteria entered. Click Search to display Events that fit the range and meet the criteria entered.
RMON Event Group ID	Displays the numeric identifier of the Event Group.
Event Type	Displays the type of notification provided for this event, as follows: `none, log, trap, both`.
Last Sent	Displays the time that passed since the last switch reboot, when the most recent event was triggered. This value is cleared when the switch reboots.
Description	Displays a text description of the event.
Owner	Displays a text string that identifies the person or entity that created this Event Group.

IP Interfaces Dashboard

To display the following form, select Layer 3 > IP Interfaces (click the underlined text, not the folder).


IP Interfaces Dashboard
1. Search Range
IP Interfaces (1-256)From 1
To 256
2. Search Options
IP Address (0.0.0.0 = any) 0.0.0.0
Subnet Mask 255.255.255.255
VLAN Identifier (0 = any) 0
State any
Search Operation or
Search
Status IP Interface ID IP Address Subnet Mask Broadcast Address VLAN ID
2 72.16.2.4 255.255.0.0 172.16.255.255 1
256 10.140.40.192 255.255.255.0 255.255.255.255 4095

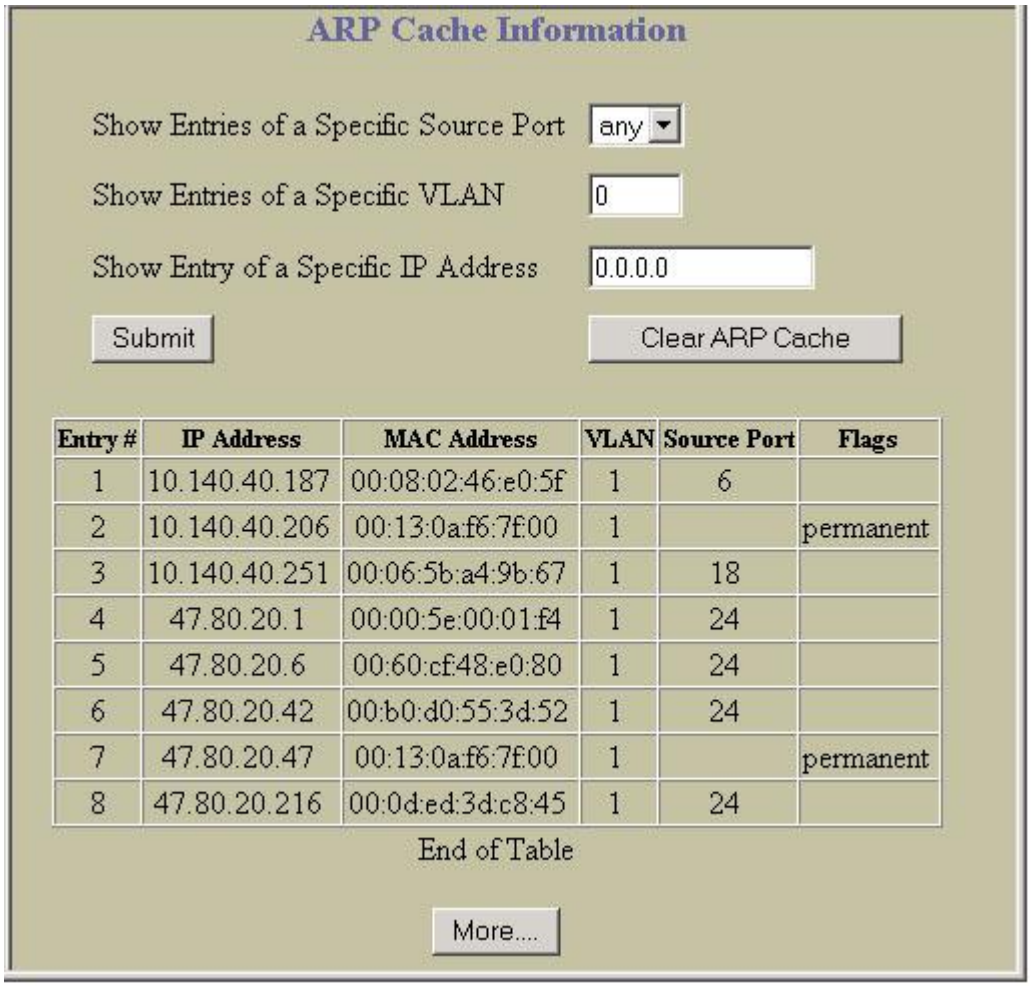
The following table describes the IP Interfaces Dashboard controls:

Table 20 IP Interfaces Dashboard controls

Control	Description
Search Range	To search for an IP Interface, enter a range of IP Interface numbers in the From and To fields.
Search Options	To focus the search for an IP Interface, enter optional search parameters: • IP Address • Subnet Mask • VLAN ID number • IP Interface State Fields that have a value of “any” are ignored during the search. Choose a search operation: • or: Search for IP Interfaces specified in the search range that meet any of the criteria entered. • and: Search for IP Interfaces specified in the search range that meet all of the criteria entered. Click Search to display IP Interfaces that fit the range and meet the criteria entered.
Status	Shows the IP Interface status: enabled (green), disabled (red), or enabled but down (blue).
IP Interface ID	Displays the numeric identifier of the IP Interface.
IP Address	Displays the IP address of the IP Interface.
Subnet Mask	Displays the Subnet Mask of the IP Interface.
Broadcast Address	Displays the IP Broadcast address for this IP Interface.
VLAN ID	Displays the VLAN number for this interface. Each interface can belong to one VLAN, although any VLAN can have multiple IP interfaces in it.

ARP Cache Information

To display the following form, select Layer 3 > ARP (click the underlined text, not the folder).


ARP Cache Information
Show Entries of a Specific Source Port
any
Show Entries of a Specific VLAN
0
Show Entry of a Specific IP Address
0.0.0.0
Submit
Clear ARP Cache
Entry # IP Address MAC Address VLAN Source Port Flags
1 10.140.40.187 00:08:02:46:e0:5f 1 6
2 10.140.40.206 00:13:0a:f6:7f:00 1 permanent
3 10.140.40.251 00:06:5b:a4:9b:67 1 18
4 47.80.20.1 00:00:5e:00:01:f4 1 24
5 47.80.20.6 00:60:cf:48:e0:80 1 24
6 47.80.20.42 00:b0:d0:55:3d:52 1 24
7 47.80.20.47 00:13:0a:f6:7f:00 1 permanent
8 47.80.20.216 00:0d:ed:3d:c8:45 1 24
End of Table
More....

The ARP information includes IP address and MAC address of each entry, address status flags, VLAN, and port for the address, and port referencing information.

The following table describes the ARP Cache Information controls:

Table 21 ARP Cache Information controls

Control	Description
Show Entries of a Specific Source Port	Displays ARP entries for the selected port(s).
Show Entries of a Specific VLAN	Displays ARP entries for the selected VLAN.
Show Entry of a Specific IP Address	Displays a single ARP entry by IP address.
Clear ARP Cache	Clears the ARP data cache.
Entry #	Displays the numeric identifier of the ARP entry.
IP Address	Displays the IP address of the ARP entry.
MAC Address	Displays the MAC address of the ARP entry.
VLAN	Displays the VLAN number of the port where the ARP entry request is received.
Source Port	Displays the source port of the ARP entry.
Flags	Displays the address status flag for the ARP entry.

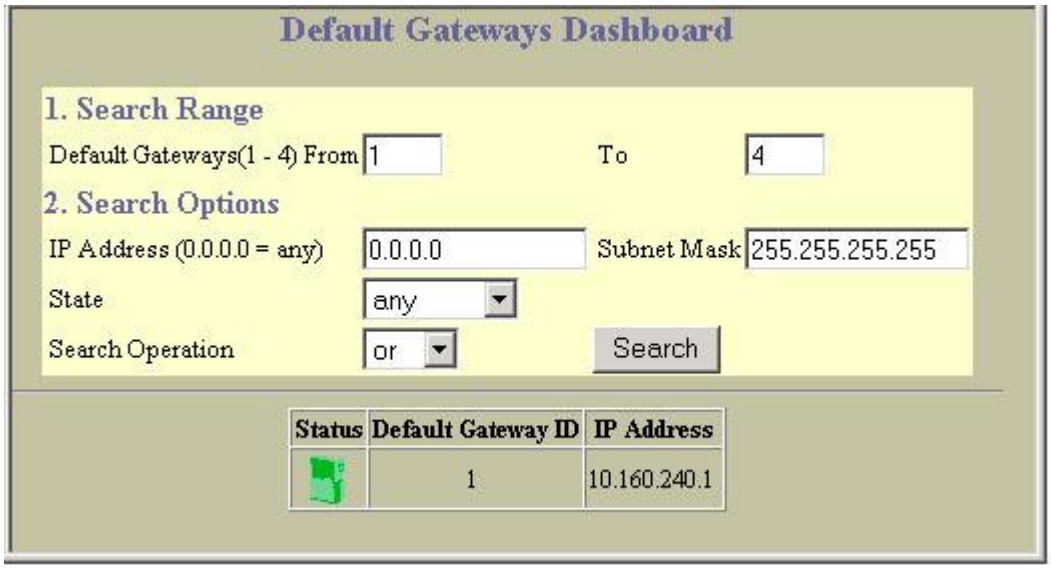
The Flags field is interpreted as follows:

Table 22 ARP Dump Flag Parameters

Flag	Description
Interface	Permanent entry created for switch IP interface
Indirect	Indirect route entry
Unresolved	Unresolved ARP entry. The MAC address has not been learned.

Default Gateways Dashboard

To display the following form, select Layer 3 > Default Gateways (click the underlined text, not the folder).



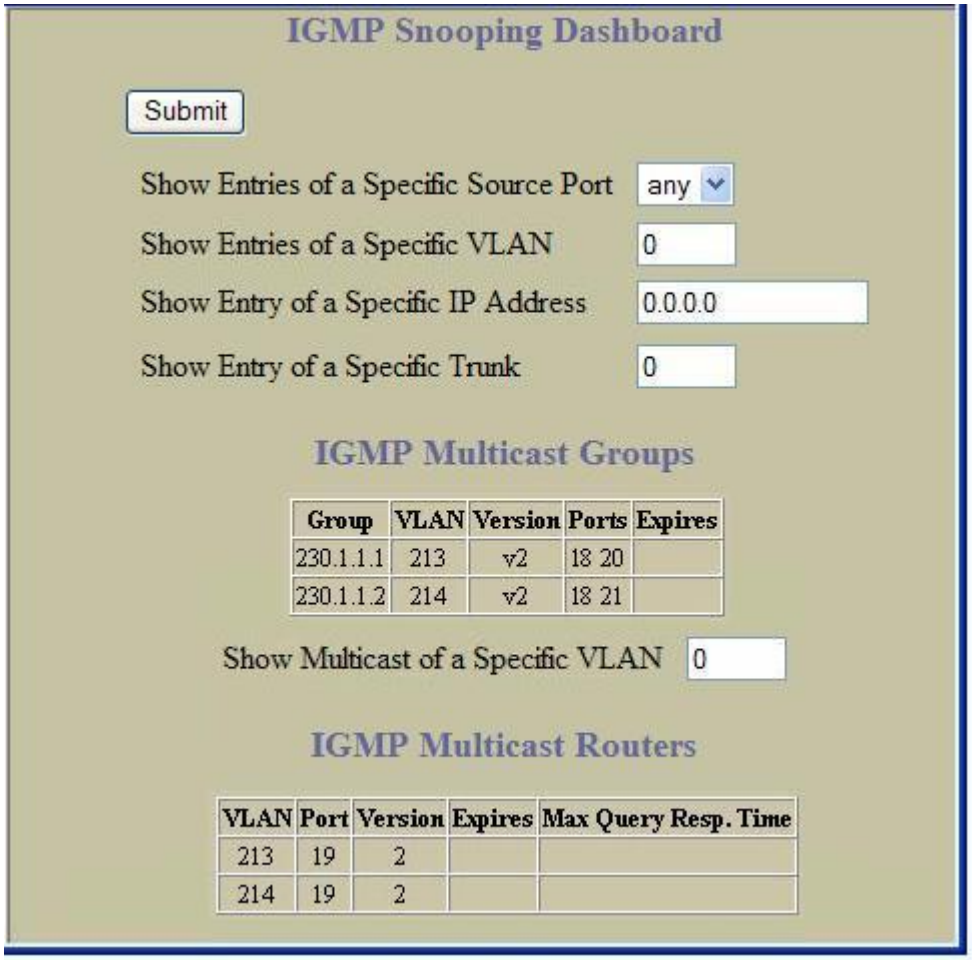
The following table describes the Default Gateways Dashboard controls:

Table 23 Default Gateways Dashboard controls

Control	Description
Search Range	To search for a Default Gateway, enter a range of Gateway numbers in the From and To fields.
Search Options	To focus the search for a Default Gateway, enter optional search parameters: • IP Address • Subnet Mask • Default Gateway State Fields that have a value of “any” are ignored during the search. Choose a search operation: or: Search for Default Gateways specified in the search range that meet any of the criteria entered. and: Search for Default Gateways specified in the search range that meet all of the criteria entered. Click Search to display Default Gateways that fit the range and meet the criteria entered.
Status	Shows if the Default Gateway is enabled (green) or disabled (red).
Default Gateway ID	Displays the numeric identifier of the Default Gateway.
IP Address	Displays the IP Address of the Default Gateway.

IGMP Snooping Dashboard

To display the following form, select Layer 3 > IGMP > IGMP Snooping (click the underlined text, not the folder).



IGMP Multicast Groups

The following table describes the IGMP Multicast Groups information.

Table 24 IGMP Multicast Groups information

Field	Description
Group	Displays the IP address of the IGMP Multicast Group.
VLAN	Displays the VLAN number of the IGMP Multicast Group.
Version	Displays the IGMP version.
Ports	Displays the port numbers of ports that carry IGMP Multicast traffic for the group.
Expires	Displays the time remaining until a Mrouter port is deleted from the Multicast IGMP table.

IGMP Multicast Routers

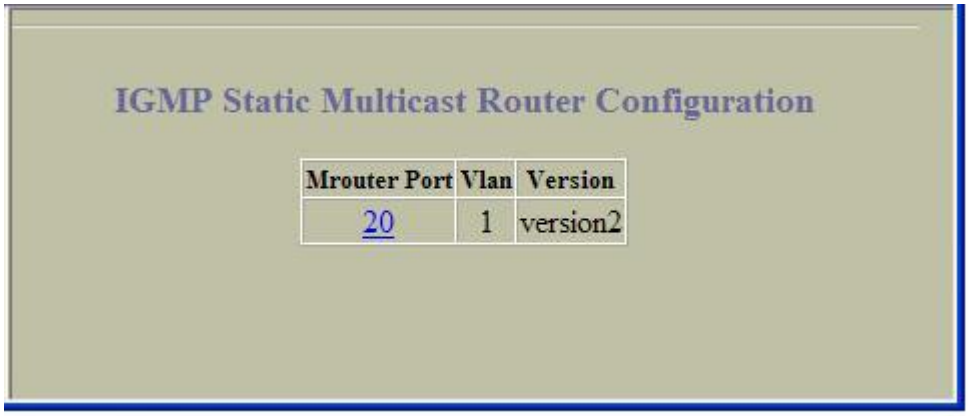
The following table describes the commands used to display information about IGMP Multicast Routers.

Table 25 IGMP Multicast Routers information

Field	Description
VLAN	Displays the VLAN number on which the Multicast Router resides.
Port	Displays the port to which the Multicast Router is connected.
Version	Displays the IGMP version.
Expires	Displays the time remaining until a Mrouter port is deleted from the Multicast IGMP table.
Max Query Resp. Time	Displays the maximum time allowed before responding to an IGMP Membership Query.

IGMP Static Multicast Router Configuration

To display the following form, select Layer 3 > IGMP > IGMP Static Mrouter (click the underlined text, not the folder).



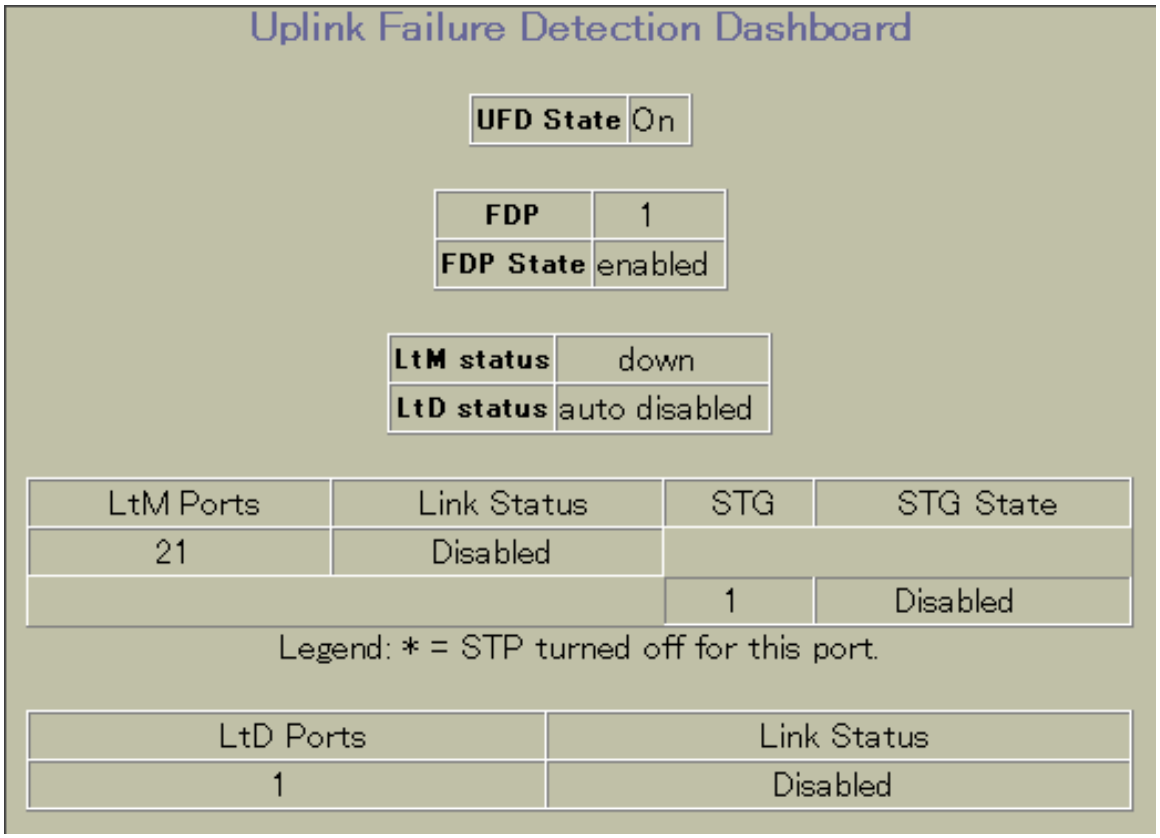
The following table describes the IGMP Static multicast router (Mrouter) information.

Table 26 IGMP Static Multicast Router information

Field	Description
Mrouter Port	Displays the port where the static Mrouter is configured.
Vlan	Displays the VLAN number of the IGMP Multicast Group.
Version	Displays the IGMP version.

Uplink Failure Detection Dashboard

To display the following form, select Uplink Failure Detection (click the underlined text, not the folder).



The following table describes the Uplink Failure Detection Dashboard controls:

Table 27 Uplink Failure Detection Dashboard controls

Control	Description
UFD State	Displays the global status of Uplink Failure Detection.
FDP	Displays the number of the Failure Detection Pair.
FDP State	Displays whether the Failure Detection Pair is enabled or disabled.
LtM status	Displays the current status of the Link to Monitor (LtM).
LtD status	Displays the current status of the Link to Disable (LtD).
LtM Ports	Displays the link status and Spanning Tree information for each port in the LtM.
LtD Ports	Displays the link status for each port in the LtD.

Viewing statistics

Introduction

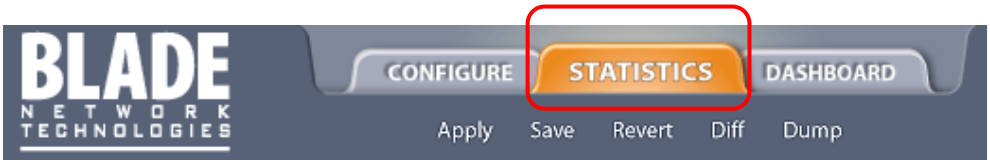
The switch BBI can be used to view a variety of switch performance statistics. The same statistics that are available through the switch's command line interface are present on the BBI statistics forms.

The following provides a basic outline for viewing statistics. You should first be familiar with configuration as covered in the *Command Reference Guide.*

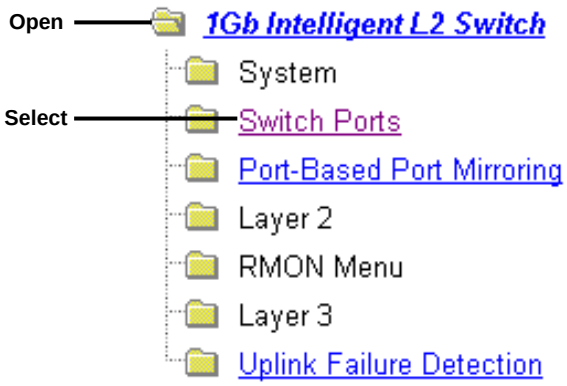
Steps for displaying statistics

Follow these basic steps for viewing switch statistics.

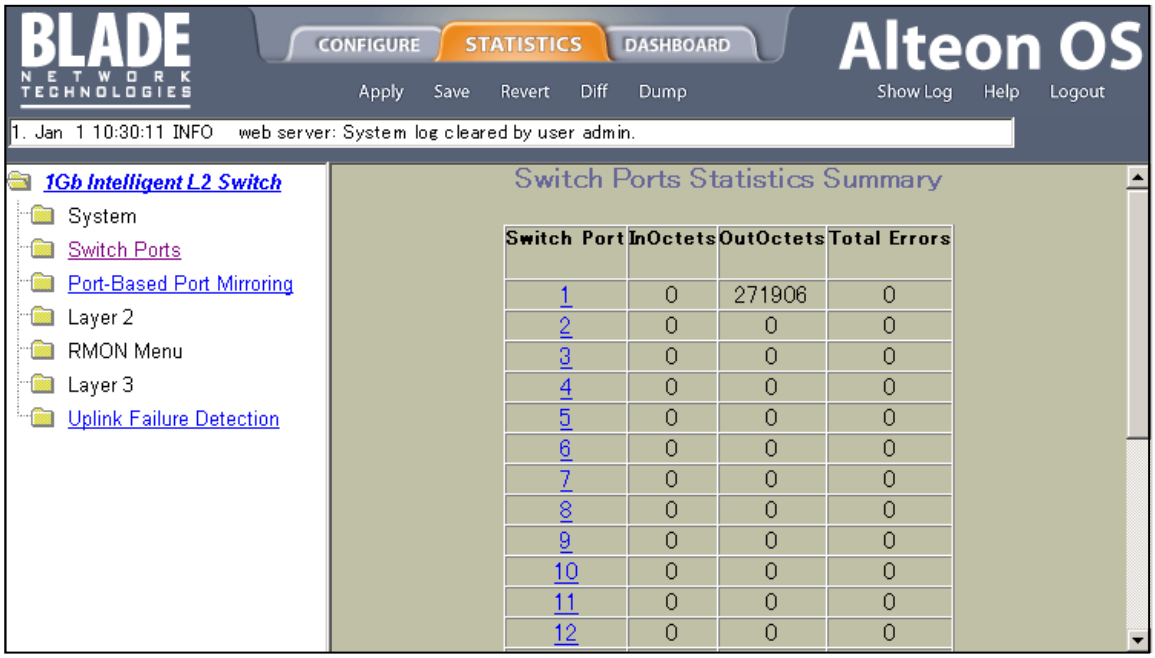
1. Select the Statistics context button in the toolbar.



2. Select a feature icon in the navigation window. For example, open the Switch folder and select Switch Ports.

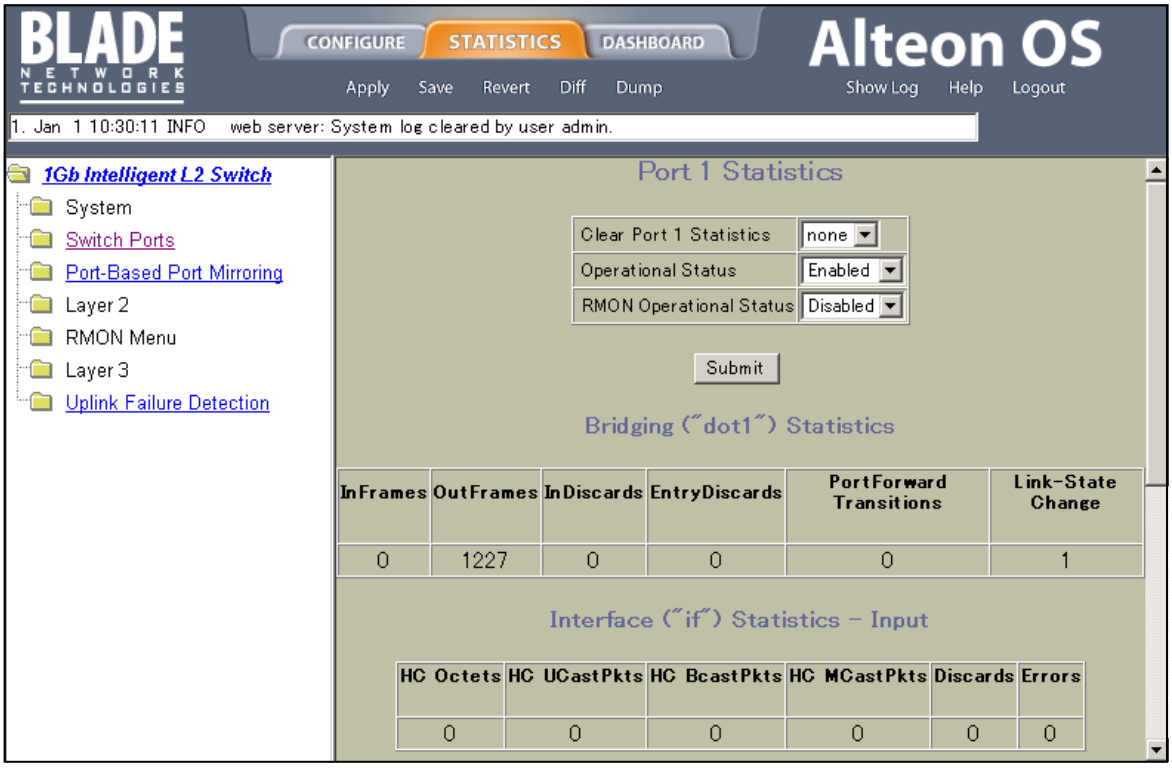


3. View the statistics in the forms window. For example:



NOTE: Items that load other forms when selected are underlined.

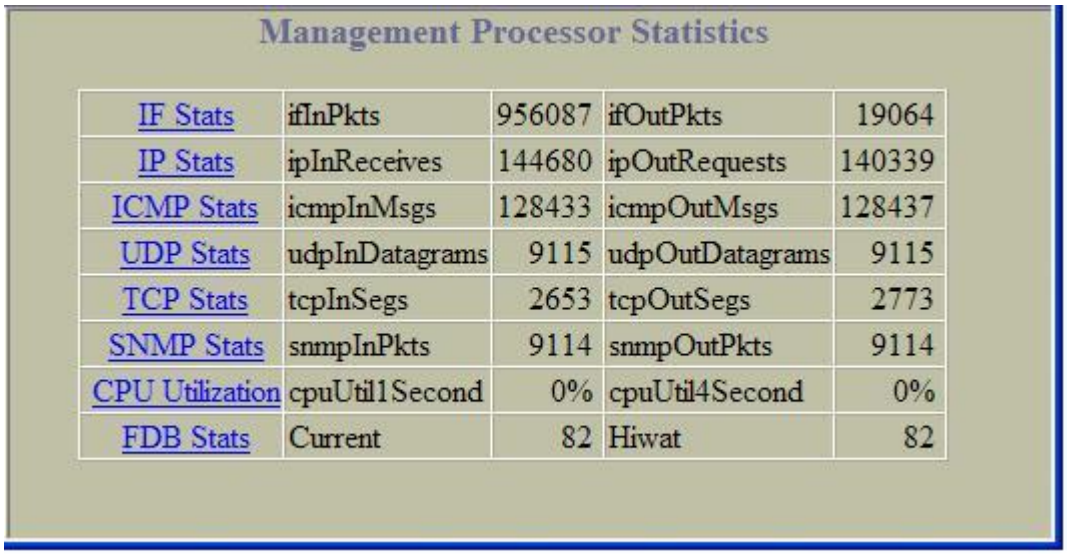
4. Select an underlined item to view details on a per port basis. For example:



NOTE: This page is refreshed every 5 seconds.

Management Processor Statistics

To display the following form, select System > General.


Management Processor Statistics
IF Stats ifInPkts 956087 ifOutPkts 19064
IP Stats ipInReceives 144680 ipOutRequests 140339
ICMP Stats icmpInMsgs 128433 icmpOutMsgs 128437
UDP Stats udpInDatagrams 9115 udpOutDatagrams 9115
TCP Stats tcpInSegs 2653 tcpOutSegs 2773
SNMP Stats snmpInPkts 9114 snmpOutPkts 9114
CPU Utilization cpuUtil1Second 0% cpuUtil4Second 0%
FDB Stats Current 82 Hiwat 82

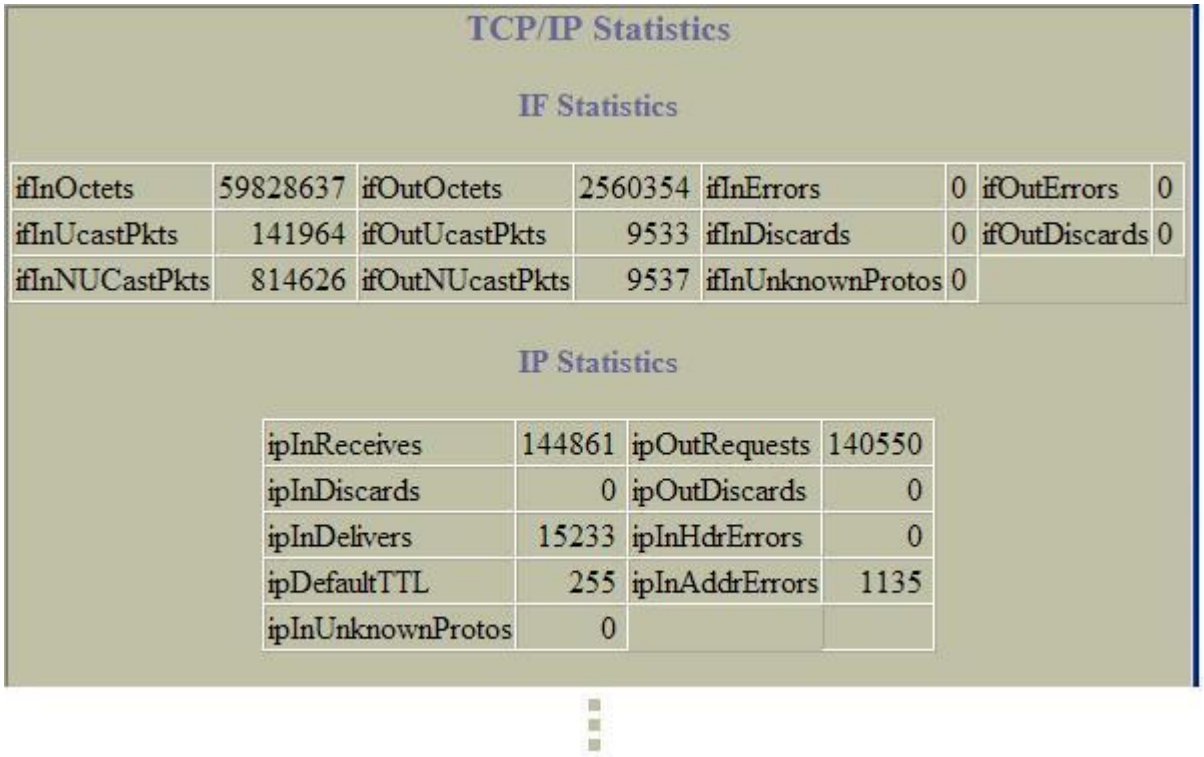
This form displays a summary of management processor (MP) statistics. MP statistics are described in the following table:

Table 28 Management Processor Statistics

Statistic	Syntax and Usage
IF Stats	Click IF Stats to display IF portion of TCP/IP statistics
IP Stats	Click IP Stats to display IP portion of TCP/IP statistics.
ICMP Stats	Click ICMP Stats to display ICMP portion of TCP/IP statistics.
UDP Stats	Click UDP Stats to display UDP/SNMP statistics.
TCP Stats	Click TCP Stats to display TCP portion of TCP/IP statistics.
SNMP Stats	Click SNMP Stats to display UDP/SNMP statistics.
CPU Utilization	Click CPU Utilization to display CPU utilization.
FDB Stats	Click FDB Stats to display FDB statistics.

TCP/IP Statistics (IF and IP Statistics)

To display the following form, go to the Management Processor Statistics form. Select one of the following: IF Stats, IP Stats, ICMP Stats, or TCP Stats.


TCP/IP Statistics
IF Statistics
ifInOctets 59828637 ifOutOctets 2560354 ifInErrors 0 ifOutErrors 0
ifInUcastPkts 141964 ifOutUcastPkts 9533 ifInDiscards 0 ifOutDiscards 0
ifInNUCastPkts 814626 ifOutNUcastPkts 9537 ifInUnknownProtos 0
IP Statistics
ipInReceives 144861 ipOutRequests 140550
ipInDiscards 0 ipOutDiscards 0
ipInDelivers 15233 ipInHdrErrors 0
ipDefaultTTL 255 ipInAddrErrors 1135
ipInUnknownProtos 0

The following table describes the interface statistics:

Table 29 IF statistics

Statistics	Description
ifInOctets	The total number of octets received on the interface, including framing characters.
ifInUcastPkts	The number of packets, delivered by this sublayer to a higher sublayer, which were not addressed to a multicast or broadcast address at this sublayer.
ifInNUCastPkts	The number of packets, delivered by this sublayer to a higher sublayer, which were addressed to a multicast or broadcast address at this sublayer. This object is deprecated in favor of ifInMulticastPkts and ifInBroadcastPkts.
ifOutOctets	The total number of octets transmitted out of the interface, including framing characters.
ifOutUcastPkts	The total number of packets that higher-level protocols requested to be transmitted, and which were not addressed to a multicast or broadcast address at this sublayer, including those that were discarded or not sent.
ifOutNUcastPkts	The total number of packets that higher-level protocols requested to be transmitted, and which were addressed to a multicast or broadcast address at this sublayer, including those that were discarded or not sent. This object is deprecated in favor of ifOutMulticastPkts and ifOutBroadcastPkts.
ifInErrors	For packet-oriented interfaces, the number of inbound packets that contained errors preventing them from being delivered to a higher-layer protocol. For character-oriented or fixed-length interfaces, the number of inbound transmission units that contained errors preventing them from being deliverable to a higher-layer protocol.
ifInDiscards	The number of inbound packets that were chosen to be discarded even though no errors were detected to prevent their being delivered to a higher-layer protocol. One possible reason for discarding such a packet could be to free up buffer space.
ifInUnknownProtos	For packet-oriented interfaces, the number of packets received via the interfaces that were discarded because of an unknown or unsupported protocol. For character-oriented or fixed-length interfaces which support protocol multiplexing the number of transmission units received via the interface which were discarded because of an unknown or unsupported protocol. For any interface that does not support protocol multiplexing, this counter will always be zero (0).

Table 29 IF statistics

Statistics	Description
ifOutErrors	For packet-oriented interfaces, the number of outbound packets that could not be transmitted because of errors. For character-oriented or fixed-length interfaces, the number of outbound transmission units that could not be transmitted because of errors.
ifOutDiscards	The number of outbound packets, which were chosen to be discarded even though no errors had been detected to prevent their being transmitted. One possible reason for discarding such a packet could be to free up buffer space.

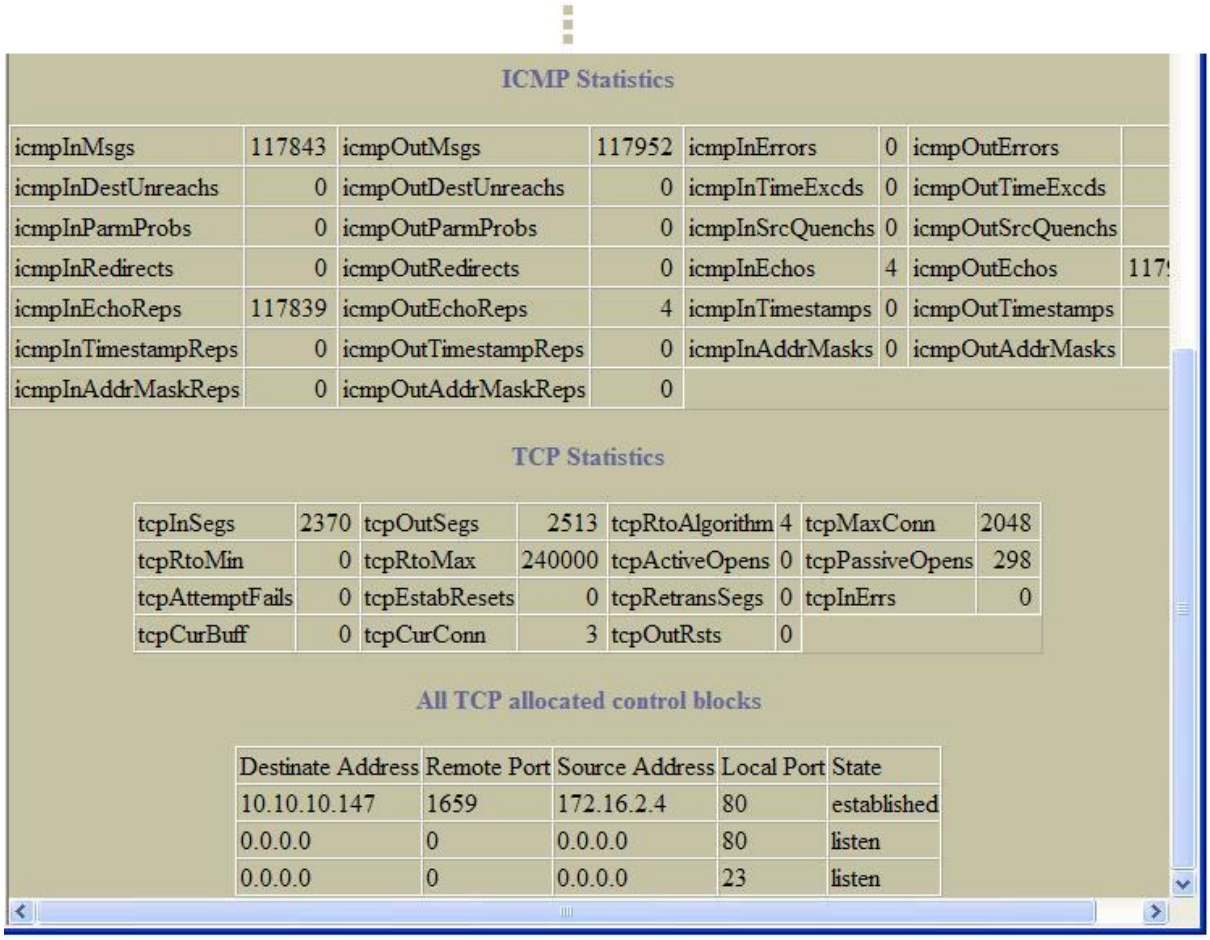
IP statistics are described in the following table:

Table 30 IP Statistics

Statistic	Description
ipInReceives	The total number of input datagrams received from interfaces, including those received in error.
ipInDiscards	The number of input IP datagrams for which no problems were encountered to prevent their continued processing, but which were discarded (for example, for lack of buffer space). Note that this counter does not include any datagrams discarded while awaiting re-assembly.
ipInDelivers	The total number of input datagrams successfully delivered to IP user protocols (including ICMP).
ipDefaultTTL	The default value inserted into the `Time-To-Live` (TTL) field of the IP header of datagrams originated at this entity (the switch), whenever a TTL value is not supplied by the transport layer protocol.
ipInUnknownProtos	The number of locally addressed datagrams received successfully but discarded because of an unknown or unsupported protocol.
ipOutRequests	The total number of IP datagrams which local IP user protocols (including ICMP) supplied to IP in requests for transmission. Note that this counter does not include any datagrams counted in `ipForwDatagrams`.
ipOutDiscards	The number of output IP datagrams for which no problem was encountered to prevent their transmission to their destination, but which were discarded (for example, for lack of buffer space). Note that this counter would include datagrams counted in `ipForwDatagrams` if any such packets met this (discretionary) discard criterion.
ipInHdrErrors	The number of input datagrams discarded due to errors in their IP headers, including bad `checksums`, version number mismatch, other format errors, time-to-live exceeded, errors discovered in processing their IP options, and so forth.
ipInAddrErrors	The number of input datagrams discarded because the IP address in their IP header's destination field was not a valid address to be received at this entity (the switch). This count includes invalid addresses (for example, 0.0.0.0) and addresses of unsupported Classes (for example, Class E). For entities which are not IP Gateways and therefore do not forward datagrams, this counter includes datagrams discarded because the destination address was not a local address.

TCP/IP Statistics (ICMP and TCP Statistics)

To display the following form, go to the Management Processor Statistics form. Select one of the following: IF Stats, IP Stats, ICMP Stats, or TCP Stats.



ICMP Statistics

icmpInMsgs	117843	icmpOutMsgs	117952	icmpInErrors	0	icmpOutErrors	
icmpInDestUnreachs	0	icmpOutDestUnreachs	0	icmpInTimeExcds	0	icmpOutTimeExcds	
icmpInParmProbs	0	icmpOutParmProbs	0	icmpInSrcQuenchs	0	icmpOutSrcQuenchs	
icmpInRedirects	0	icmpOutRedirects	0	icmpInEchos	4	icmpOutEchos	117
icmpInEchoReps	117839	icmpOutEchoReps	4	icmpInTimestamps	0	icmpOutTimestamps	
icmpInTimestampReps	0	icmpOutTimestampReps	0	icmpInAddrMasks	0	icmpOutAddrMasks	
icmpInAddrMaskReps	0	icmpOutAddrMaskReps	0				

TCP Statistics

tcpInSegs	2370	tcpOutSegs	2513	tcpRtoAlgorithm	4	tcpMaxConn	2048
tcpRtoMin	0	tcpRtoMax	240000	tcpActiveOpens	0	tcpPassiveOpens	298
tcpAttemptFails	0	tcpEstabResets	0	tcpRetransSegs	0	tcpInErrs	0
tcpCurBuff	0	tcpCurConn	3	tcpOutRsts	0		

All TCP allocated control blocks

Destinate Address	Remote Port	Source Address	Local Port	State
10.10.10.147	1659	172.16.2.4	80	established
0.0.0.0	0	0.0.0.0	80	listen
0.0.0.0	0	0.0.0.0	23	listen

ICMP statistics are described in the following table:

Table 31 ICMP Statistics

Statistic	Description
icmpInMsgs	The total number of ICMP messages which the entity (the switch) received. Note that this counter includes all those counted by `icmpInErrors`.
icmpOutMsgs	The total number of ICMP messages which this entity (the switch) attempted to send. Note that this counter includes all those counted by `icmpOutErrors`.
icmpInErrors	The number of ICMP messages that the entity (the switch) received but determined as having ICMP-specific errors (bad ICMP `checksums`, bad length, and so forth).
icmpOutErrors	The number of ICMP messages which this entity (the switch) did not send due to problems discovered within ICMP such as a lack of buffer. This value should not include errors discovered outside the ICMP layer such as the inability of IP to route the resultant datagram. In some implementations there may be no types of errors that contribute to this counter's value.
icmpInDestUnreachs	The number of ICMP Destination Unreachable messages received.
icmpOutDestUnreachs	The number of ICMP Destination Unreachable messages sent.
icmpInTimeExcds	The number of ICMP Time Exceeded messages received.
icmpOutTimeExcds	The number of ICMP Time Exceeded messages sent.
icmpInParmProbs	The number of ICMP Parameter Problem messages received.
icmpOutParmProbs	The number of ICMP Parameter Problem messages sent.
icmpInSrcQuenchs	The number of ICMP Source Quench (buffer almost full, stop sending data) messages received.
icmpOutSrcQuenchs	The number of ICMP Source Quench (buffer almost full, stop sending data) messages sent.
icmpInRedirects	The number of ICMP Redirect messages received.
icmpOutRedirects	The number of ICMP Redirect messages sent. For a host, this object will always be zero, since hosts do not send redirects.
icmpInEchos	The number of ICMP Echo (request) messages received.
icmpOutEchos	The number of ICMP Echo (request) messages sent.
icmpInEchoReps	The number of ICMP Echo Reply messages received.
icmpOutEchoReps	The number of ICMP Echo Reply messages sent.
icmpInTimestamps	The number of ICMP Timestamp (request) messages received.
icmpOutTimestamps	The number of ICMP Timestamp (request) messages sent.
icmpInTimestampReps	The number of ICMP Timestamp `Reply` messages received.
icmpOutTimestampReps	The number of ICMP Timestamp `Reply` messages sent.
icmpInAddrMasks	The number of ICMP Address Mask Request messages received.
icmpOutAddrMasks	The number of ICMP Address Mask Request messages sent.
icmpInAddrMaskReps	The number of ICMP Address Mask Reply messages received.
icmpOutAddrMaskReps	The number of ICMP Address Mask Reply messages sent.

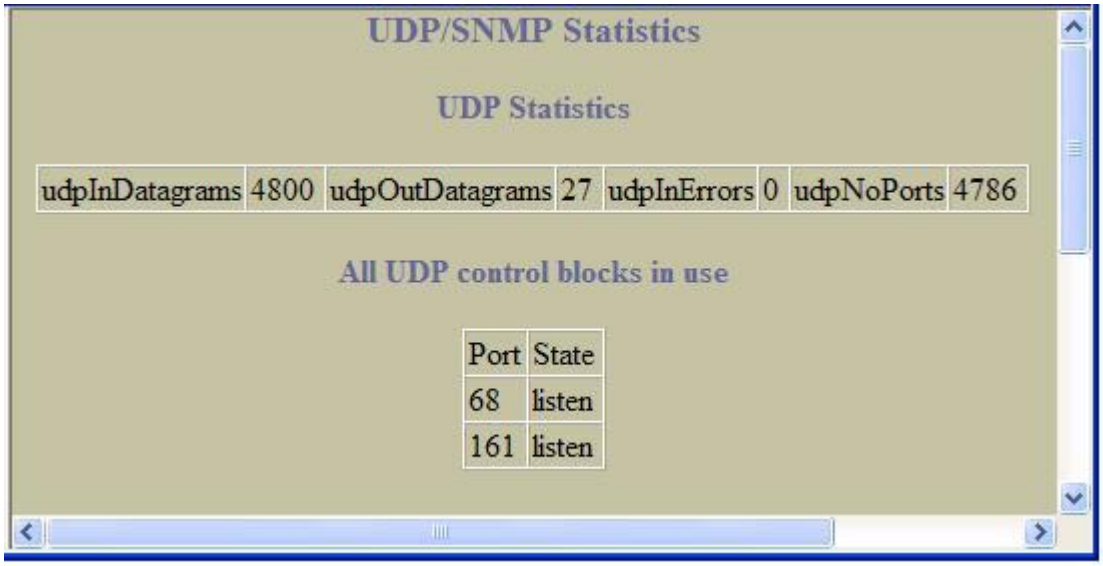
TCP statistics are described in the following table:

Table 32 TCP Statistics

Statistic	Description
tcpInSegs	The total number of segments received, including those received in error. This count includes segments received on currently established connections.
tcpOutSegs	The total number of segments sent, including those on current connections, but excluding those containing only retransmitted octets.
tcpRtoAlgorithm	The algorithm used to determine the timeout value used for retransmitting unacknowledged octets.
tcpMaxConn	The limit on the total number of TCP connections the entity (the switch) can support. In entities where the maximum number of connections is dynamic, this object should contain the value -1.
tcpRtoMin	The minimum value permitted by a TCP implementation for the retransmission timeout, measured in milliseconds. More refined semantics for objects of this type depend upon the algorithm used to determine the retransmission timeout. In particular, when the timeout algorithm is rsre(3), an object of this type has the semantics of the LBOUND quantity described in RFC 793.
tcpRtoMax	The maximum value permitted by a TCP implementation for the retransmission timeout, measured in milliseconds. More refined semantics for objects of this type depend upon the algorithm used to determine the retransmission timeout. In particular, when the timeout algorithm is rsre(3), an object of this type has the semantics of the UBOUND quantity described in RFC 793.
tcpActiveOpens	The number of times TCP connections have made a direct transition to the SYN-SENT state from the CLOSED state.
tcpPassiveOpens	The number of times TCP connections have made a direct transition to the SYN-RCVD state from the LISTEN state.
tcpAttemptFails	The number of times TCP connections have made a direct transition to the CLOSED state from either the SYN-SENT state or the SYNRCVD state, plus the number of times TCP connections have made a direct transition to the LISTEN state from the SYN-RCVD state.
tcpEstabResets	The number of times TCP connections have made a direct transition to the CLOSED state from either the ESTABLISHED state or the CLOSE-WAIT state.
tcpRetransSegs	The total number of segments retransmitted - that is, the number of TCP segments transmitted containing one or more previously transmitted octets.
tcpInErrs	The total number of segments received in error (for example, bad TCP checksums).
tcpCurBuff	The total number of outstanding memory allocations from heap by TCP protocol stack.
tcpCurConn	The total number of outstanding TCP sessions that are currently opened.
tcpOutRsts	The number of TCP segments sent containing the RST flag.
All TCP allocated control blocks	
Destinate Address	Switch IP address of TCP connections.
Remote Port	TCP port used by the remote device.
Source Address	IP address of TCP source connections.
Local Port	Available TCP ports used for connecting to the switch.
State	State of each TCP connection.

UDP/SNMP Statistics

To display the following form, go to the Management Processor Statistics form. Select UDP Stats or SNMP Stats.

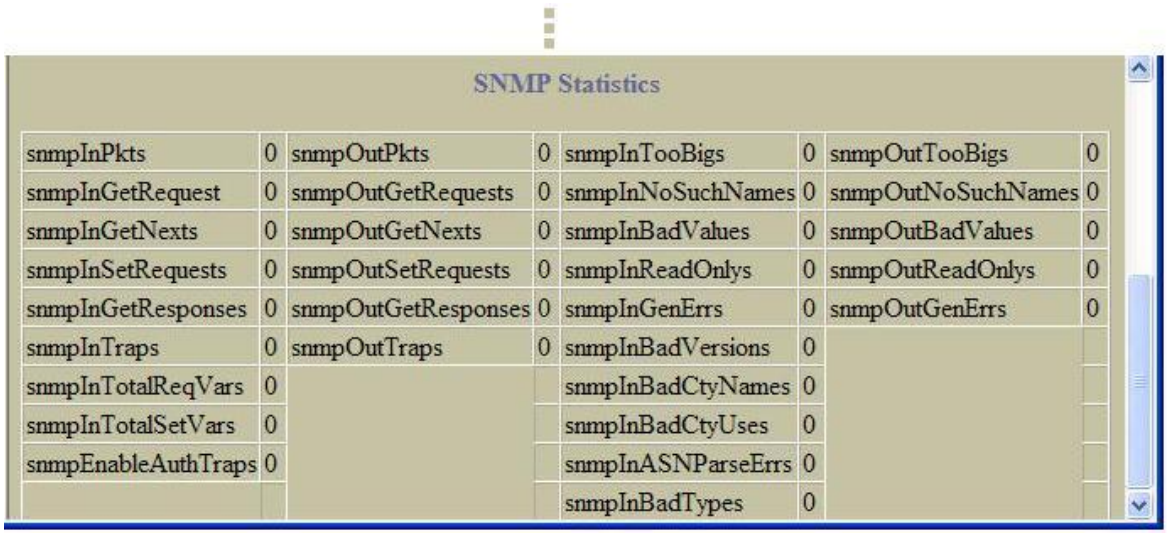


UDP statistics are described in the following table:

Table 33 UDP Statistics

Statistic	Description
udpInDatagrams	The total number of UDP datagrams delivered to the switch.
udpOutDatagrams	The total number of UDP datagrams sent from this entity (the switch).
udpInErrors	The number of received UDP datagrams that could not be delivered for reasons other than the lack of an application at the destination port.
udpNoPorts	The total number of received UDP datagrams for which there was no application at the destination port.

To display the following form, go to the Management Processor Statistics form. Select UDP Stats or SNMP Stats, and scroll down.


SNMP Statistics
snmpInPkts 0 snmpOutPkts 0 snmpInTooBigs 0 snmpOutTooBigs 0
snmpInGetRequest 0 snmpOutGetRequests 0 snmpInNoSuchNames 0 snmpOutNoSuchNames 0
snmpInGetNexts 0 snmpOutGetNexts 0 snmpInBadValues 0 snmpOutBadValues 0
snmpInSetRequests 0 snmpOutSetRequests 0 snmpInReadOnlys 0 snmpOutReadOnlys 0
snmpInGetResponses 0 snmpOutGetResponses 0 snmpInGenErrs 0 snmpOutGenErrs 0
snmpInTraps 0 snmpOutTraps 0 snmpInBadVersions 0
snmpInTotalReqVars 0 snmpInBadCtyNames 0
snmpInTotalSetVars 0 snmpInBadCtyUses 0
snmpEnableAuthTraps 0 snmpInASNParseErrs 0
snmpInBadTypes 0

SNMP statistics are described in the following table:

Table 34 SNMP Statistics

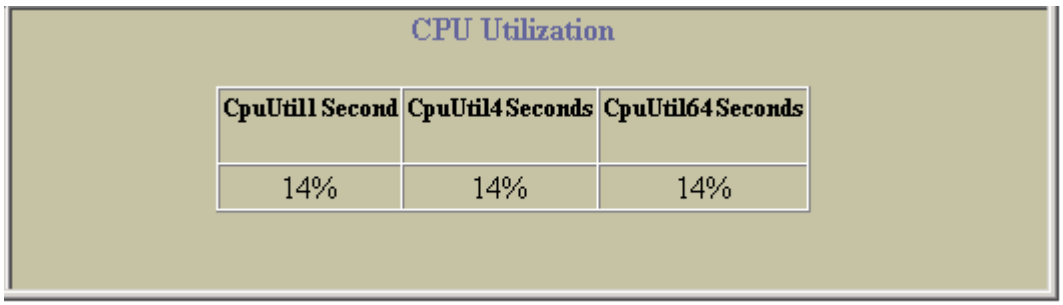
Statistic	Description
snmpInPkts	The total number of Messages delivered to the SNMP entity from the transport service.
snmpOutPkts	The total number of SNMP Messages that were passed from the SNMP protocol entity to the transport service.
snmpInTooBigs	The total number of SNMP Protocol Data Units (PDUs) that were delivered to the SNMP protocol entity and for which the value of the error-status field is too big.
snmpOutTooBigs	The total number of SNMP Protocol Data Units (PDUs), which were generated by the SNMP protocol entity and for which the value of the error-status field is too big.
snmpInGetRequest	The total number of SNMP Get-Request Protocol Data Units (PDUs), which have been accepted and processed by the SNMP protocol entity.
snmpOutGetRequests	The total number of SNMP Get-Request Protocol Data Units (PDUs), which have been generated by the SNMP protocol entity.
snmpInNoSuchNames	The total number of SNMP Protocol Data Units (PDUs) that were delivered to the SNMP protocol entity and for which the value of the error-status field is `noSuchName`.
snmpOutNoSuchNames	The total number of SNMP Protocol Data Units (PDUs), which were generated by the SNMP protocol entity and for which the value of the error-status is `noSuchName`.
snmpInGetNexts	The total number of SNMP Get-Next Protocol Data Units (PDUs), which have been accepted and processed by the SNMP protocol entity.
snmpOutGetNexts	The total number of SNMP Get-Next Protocol Data Units (PDUs), which have been generated by the SNMP protocol entity.
snmpInBadValues	The total number of SNMP Protocol Data Units (PDUs) that were delivered to the SNMP protocol entity and for which the value of the error-status field is `badValue`.
snmpOutBadValues	The total number of SNMP Protocol Data Units (PDUs), which were generated by the SNMP protocol entity and for which the value of the error-status field is `badValue`.
snmpInSetRequests	The total number of SNMP Set-Request Protocol Data Units (PDUs), which have been accepted and processed by the SNMP protocol entity.
snmpOutSetRequests	The total number of SNMP Set-Request Protocol Data Units (PDUs), which have been generated by the SNMP protocol entity.
snmpInReadOnlys	The total number of valid SNMP Protocol Data Units (PDUs), which were delivered to the SNMP protocol entity and for which the value of the error-status field is 'read-Only'. It should be noted that it is a protocol error to generate an SNMP PDU, which contains the value 'read-Only' in the error-status field. As such, this object is provided as a means of detecting incorrect implementations of the SNMP.
snmpOutReadOnlys	Not in use.
snmpInGetResponses	The total number of SNMP Get-Response Protocol Data Units (PDUs) that were delivered to the SNMP protocol entity.
snmpOutGetResponses	The total number of SNMP Get-Response Protocol Data Units (PDUs), which have been generated by the SNMP protocol entity.
snmpInGenErrs	The total number of SNMP Protocol Data Units (PDUs), which were delivered to the SNMP protocol entity and for which the value of the error-status field is `genErr`.
snmpOutGenErrs	The total number of SNMP Protocol Data Units (PDUs), which were generated by the SNMP protocol entity and for which the value of the error-status field is `genErr`.
snmpInTraps	The total number of SNMP Trap Protocol Data Units (PDUs), which have been accepted and processed by the SNMP protocol entity.
snmpOutTraps	The total number of SNMP Trap Protocol Data Units (PDUs), which have been generated by the SNMP protocol entity.
snmpInBadVersions	The total number of SNMP Messages, which were delivered to the SNMP protocol entity and were for an unsupported SNMP version.
snmpInTotalReqVars	The total number of MIB objects which have been retrieved successfully by the SNMP protocol entity as a result of receiving valid SNMP Get- Request and Get-Next Protocol Data Units (PDUs).
snmpInBadCtyNames	The total number of SNMP Messages delivered to the SNMP entity that used an SNMP community name not known to the said entity (the switch).
snmpInTotalSetVars	The total number of MIB objects, which have been altered successfully by the SNMP protocol entity as a result of receiving valid SNMP Set-Request Protocol Data Units (PDUs).

Table 34 SNMP Statistics

Statistic	Description
snmpInBadCtyUses	The total number of SNMP Messages delivered to the SNMP protocol entity that represented an SNMP operation that was not allowed by the SNMP community named in the Message.
snmpEnableAuthTraps	An object to enable or disable the authentication traps generated by this entity (the switch).
snmpInASNParseErrs	The total number of ASN.1 or BER errors encountered by the SNMP protocol entity when decoding SNMP Messages received. Note: OSI's method of specifying abstract objects is called ASN.1 (Abstract Syntax Notation One, defined in X.208), and one set of rules for representing such objects as strings of ones and zeros is called the BER (Basic Encoding Rules, defined in X.209). ASN.1 is a flexible notation that allows one to define a variety of data types, from simple types such as integers and bit strings to structured types such as sets and sequences. BER describes how to represent or encode values of each ASN.1 type as a string of eight-bit octets.
snmpInBadTypes	The total number of SNMP Messages which failed ASN parsing.

CPU Utilization

To display the following form, go to the Management Processor Statistics form. Select CPU Utilization.



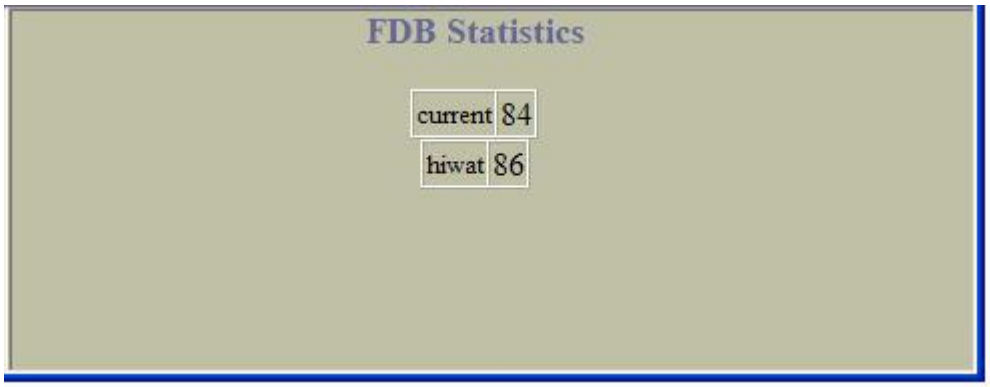
CPU statistics are described in the following table:

Table 35 CPU Statistics

Statistic	Description
CpuUtil1Second	The utilization of MP CPU over 1 second. It shows the percentage.
CpuUtil4Seconds	The utilization of MP CPU over 4 seconds. It shows the percentage.
CpuUtil64Seconds	The utilization of MP CPU over 64 seconds. It shows the percentage.

FDB Statistics

To display the following form, go to the Management Processor Statistics form. Select FDB Stats.



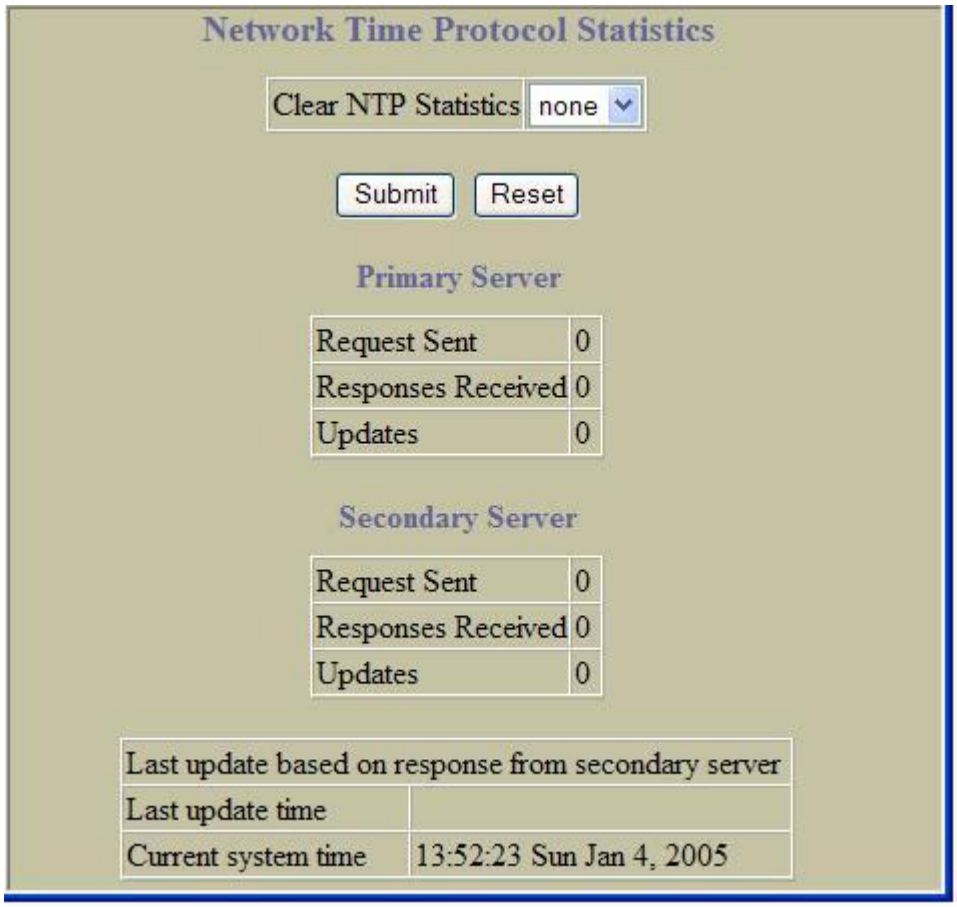
FDB statistics are described in the following table:

Table 36 Forwarding Database Statistics

Statistic	Description
current	Current number of entries in the Forwarding Database.
hiwat	Highest number of entries recorded at any given time in the Forwarding Database.

Network Time Protocol Statistics

To display the following form, select System > NTP.



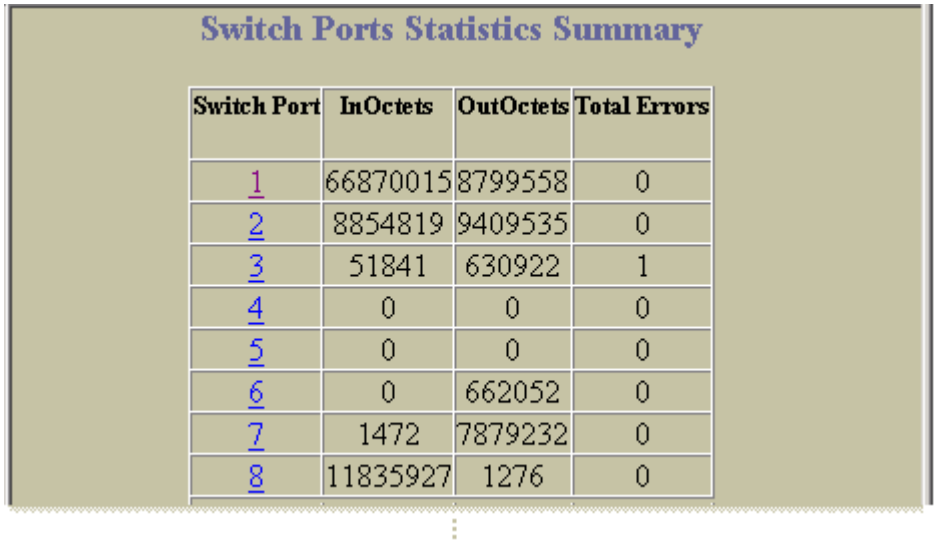
Network Time Protocol statistics for the primary and secondary NTP servers are described in the following table:

Table 37 NTP Statistics

Statistic	Description
Request Sent	The total number of NTP requests the switch sent to the primary NTP server to synchronize time.
Responses Received	The total number of NTP responses received from the primary NTP server.
Updates	The total number of times the switch updated its time based on the NTP responses received from the primary NTP server.
Last update time	The time stamp showing the time when the switch was last updated.
Current system time	The current switch system time.

Switch Ports Statistics Summary

To display the following form, select Switch Ports (click the underlined text, not the folder).



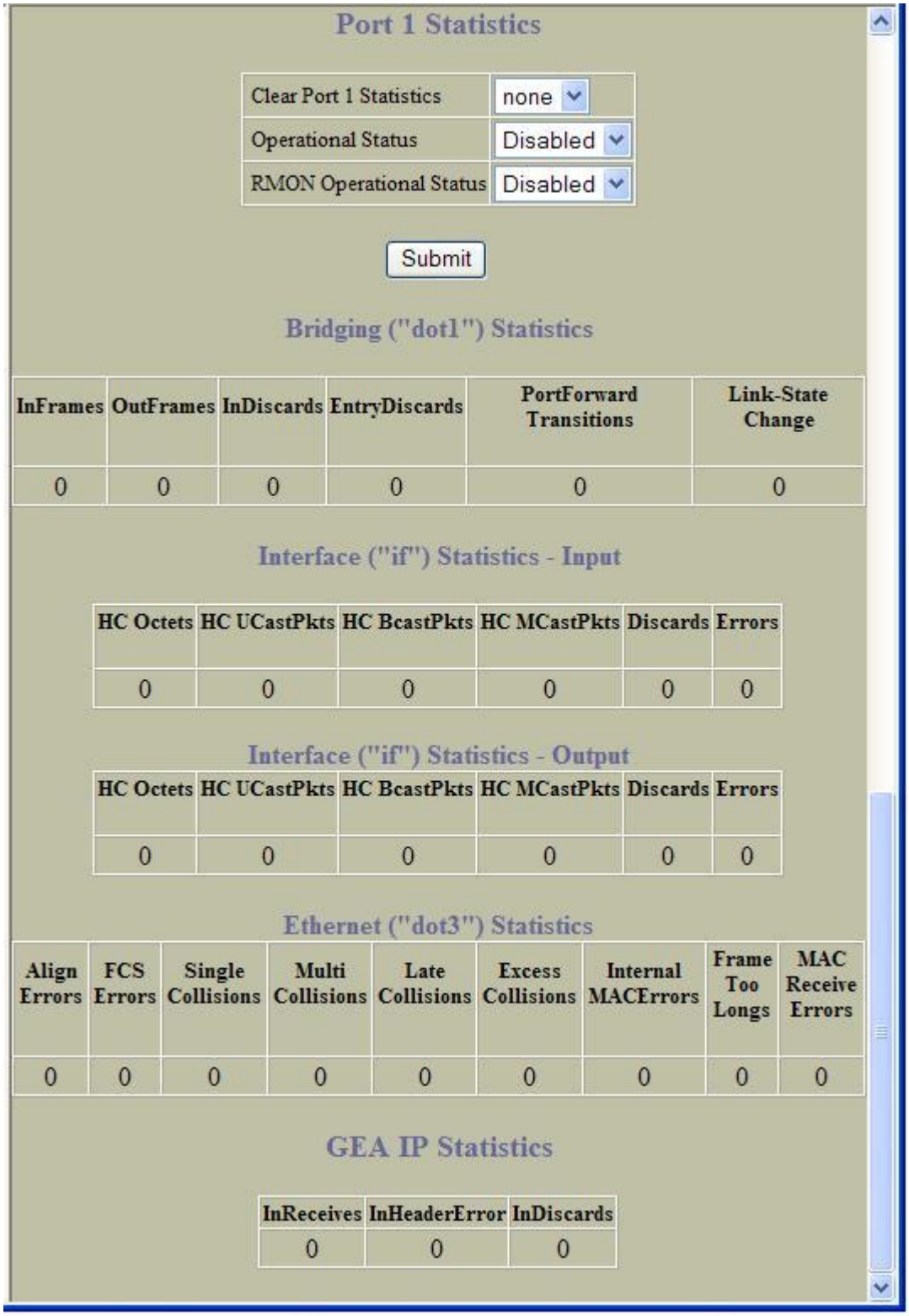
Switch Ports Statistics Summary

Switch Port	InOctets	OutOctets	Total Errors
1	66870015	8799558	0
2	8854819	9409535	0
3	51841	630922	1
4	0	0	0
5	0	0	0
6	0	662052	0
7	1472	7879232	0
8	11835927	1276	0

This form displays traffic statistics on a port-by-port basis. For more information, select a port number to display detailed statistics for that port.

Port Statistics

To display the following form, go to the Switch Ports Statistics Summary form. Select a Switch Port number.



Port 1 Statistics

Clear Port 1 Statistics	none
Operational Status	Disabled
RMON Operational Status	Disabled

Submit

Bridging ("dot1") Statistics

InFrames	OutFrames	InDiscards	EntryDiscards	PortForward Transitions	Link-State Change
0	0	0	0	0	0

Interface ("if") Statistics - Input

HC Octets	HC UCastPkts	HC BcastPkts	HC MCastPkts	Discards	Errors
0	0	0	0	0	0

Interface ("if") Statistics - Output

HC Octets	HC UCastPkts	HC BcastPkts	HC MCastPkts	Discards	Errors
0	0	0	0	0	0

Ethernet ("dot3") Statistics

Align Errors	FCS Errors	Single Collisions	Multi Collisions	Late Collisions	Excess Collisions	Internal MACErrors	Frame Too Longs	MAC Receive Errors
0	0	0	0	0	0	0	0	0

GEA IP Statistics

InReceives	InHeaderError	InDiscards
0	0	0

Port statistics are described in the following table:

Table 38 Port Statistics

Control	Description
Clear Port x Statistics	Select Clear and click Submit to clear statistics for this port.
Operational Status	Enables or disables the port.
RMON Operational Status	Enables or disables RMON for the port.

The next several tables contain specific information about bridging, interface (input and output), and Ethernet statistics.

Bridging (“dot1”) Statistics

The following table describes the bridging statistics of the selected port:

Table 39 Bridging statistics of a port

Statistic	Description
InFrames	The number of frames that have been received by this port from its segment. A frame received on the interface corresponding to this port is only counted by this object if and only if it is for a protocol being processed by the local bridging function, including bridge management frames.
OutFrames	The number of frames that have been transmitted by this port to its segment. Note that a frame transmitted on the interface corresponding to this port is only counted by this object if and only if it is for a protocol being processed by the local bridging function, including bridge management frames.
InDiscards	Count of valid frames received that were discarded (that is, filtered) by the Forwarding Process.
EntryDiscards	The total number of Forwarding Database entries, which have been or would have been learnt, but have been discarded due to a lack of space to store them in the Forwarding Database. If this counter is increasing, it indicates that the Forwarding Database is regularly becoming full (a condition which has unpleasant performance effects on the sub network). If this counter has a significant value but is not presently increasing, it indicates that the problem has been occurring but is not persistent.
PortForward Transitions	The number of times this port has transitioned from the Learning state to the Forwarding state.
Link-State Change	The number of times an interface has transitioned from either down to up or from up to down.

Interface (“if”) Statistics - Input

The following table describes the interface input statistics of the selected port:

Table 40 Interface Statistics for a Port - Input

Statistic	Description
HC Octets	The total number of octets received on the interface, including framing characters.
HC UCastPkts	The number of packets, delivered by this sub layer to a higher sub layer, which were not addressed to a multicast or broadcast address at this sub layer.
HC BcastPkts	The number of packets, delivered by this sub layer to a higher sub layer, which were addressed to a broadcast address at this sub layer.
HC MCastPkts	The total number of packets that higher-level protocols requested to be transmitted, and which were addressed to a multicast address at this sub layer, including those that were discarded or not sent. For a MAC layer protocol, this includes both Group and Functional addresses.
Discards	The number of inbound packets that were chosen to be discarded even though no errors had been detected to prevent their being delivered to a higher-layer protocol. One possible reason for discarding such a packet could be to free up buffer space.
Errors	For packet-oriented interfaces, the number of inbound packets that contained errors preventing them from being delivered to a higher-layer protocol. For character-oriented or fixed-length interfaces, the number of inbound transmission units that contained errors preventing them from being deliverable to a higher-layer protocol.

Interface (“if”) Statistics - Output

The following table describes the interface output statistics of the selected port:

Table 41 Interface Statistics for a Port - Output

Statistic	Description
HC Octets	The total number of octets transmitted out of the interface, including framing characters.
HC UCastPkts	The total number of packets that higher-level protocols requested to be transmitted, and which were not addressed to a multicast or broadcast address at this sub layer, including those that were discarded or not sent.
HC BcastPkts	The total number of packets that higher-level protocols requested to be transmitted, and which were addressed to a broadcast address at this sub layer, including those that were discarded or not sent. This object is a 64-bit version of `ifOutBroadcastPkts`
HC MCastPkts	The total number of packets that higher-level protocols requested to be transmitted, and which were addressed to a multicast address at this sub layer, including those that were discarded or not sent. For a MAC layer protocol, this includes both Group and Functional addresses. This object is a 64-bit version of `ifOutMulticastPkts`.
Discards	The number of outbound packets that were chosen to be discarded even though no errors had been detected to prevent their being transmitted. One possible reason for discarding such a packet could be to free up buffer space.
Errors	For packet-oriented interfaces, the number of outbound packets that could not be transmitted because of errors. For character-oriented or fixed-length interfaces, the number of outbound transmission units that could not be transmitted because of errors.

Ethernet (“dot3”) Statistics

The following table describes the Ethernet statistics of the selected port:

Table 42 Ethernet Statistics for a Port

Statistic	Description
Align Errors	A count of frames received on a particular interface that is not an integral number of octets in length and do not pass the Frame Check Sequence (FCS) check. The count represented by an instance of this object is incremented when the `alignmentError` status is returned by the MAC service to the Logical Link Control (LLC) (or other MAC user). Received frames for which multiple error conditions obtained are, according to the conventions of IEEE 802.3 Layer Management, counted exclusively according to the error status presented to the LLC.
FCS Errors	A count of frames received on a particular interface that is an integral number of octets in length but do not pass the Frame Check Sequence (FCS) check. The count represented by an instance of this object is incremented when the `frameCheckError` status is returned by the MAC service to the LLC (or other MAC user). Received frames for which multiple error conditions obtained are, according to the conventions of IEEE 802.3 Layer Management, counted exclusively according to the error status presented to the LLC.
Single Collisions	A count of successfully transmitted frames on a particular interface for which transmission is inhibited by exactly one collision. A frame that is counted by an instance of this object is also counted by the corresponding instance of the `ifOutUcastPkts`, `ifOutMulticastPkts`, or `ifOutBroadcastPkts`, and is not counted by the corresponding instance of the `dot3StatsMultipleCollision-Frame` object.
Multi Collisions	A count of successfully transmitted frames on a particular interface for which transmission is inhibited by more than one collision. A frame that is counted by an instance of this object is also counted by the corresponding instance of the `ifOutUcastPkts`, `ifOutMulticastPkts`, or `ifOutBroadcastPkts`, and is not counted by the corresponding instance of the `dot3StatsSingleCollision-Frames` object.
Late Collisions	The number of times that a collision is detected on a particular interface later than 512 bit-times into the transmission of a packet. Five hundred and twelve bit-times corresponds to 51.2 microseconds on a 10 Mbit/s system. A (late) collision included in a count represented by an instance of this object is also considered as a (generic) collision for purposes of other collision-related statistics.

Table 42 Ethernet Statistics for a Port

Statistic	Description
Excess Collisions	A count of frames for which transmission on a particular interface fails due to excessive collisions.
Internal MACErrors	A count of frames for which transmission on a particular interface fails due to an internal MAC sub layer transmit error. A frame is only counted by an instance of this object if it is not counted by the corresponding instance of the `dot3StatsLateCollisions` object, the `dot3StatsExcessiveCollisions` object, or the `dot3Stats-CarrierSenseErrors` object. The precise meaning of the count represented by an instance of this object is implementation-specific. In particular, an instance of this object may represent a count of transmission errors on a particular interface that are not otherwise counted.
Frame Too Longs	A count of frames received on a particular interface that exceeds the maximum permitted frame size. The count represented by an instance of this object is incremented when the `frameTooLong` status is returned by the MAC service to the LLC (or other MAC user). Received frames for which multiple error conditions obtained are, according to the conventions of IEEE 802.3 Layer Management, counted exclusively according to the error status presented to the LLC.
Mac Receive Errors	A count of frames for which reception on a particular interface fails due to an internal MAC sub layer receive error. A frame is only counted by an instance of this object if it is not counted by the corresponding instance of the `dot3StatsFrameTooLongs` object, the `dot3Stats-AlignmentErrors` object, or the `dot3StatsFCSErrors` object. The precise meaning of the count represented by an instance of this object is implementation-specific. In particular, an instance of this object may represent a count of received errors on a particular interface that are not otherwise counted.

GEA IP Statistics

The following table describes the GEA statistics for the selected port:

Table 43 GEA IP statistics of a port

Statistic	Description
InReceives	The total number of input datagrams received from interfaces, including those received in error.
InHeaderError	The number of input datagrams discarded because the IP address in their IP header's destination field was not a valid address to be received at this entity (the switch).
InDiscards	The number of input IP datagrams for which no problems were encountered to prevent their continued processing, but which were discarded (for example, for lack of buffer space). Note that this counter does not include any datagrams discarded while awaiting re-assembly.

FDB Statistics

To display the following form, select Layer 2 > FDB.

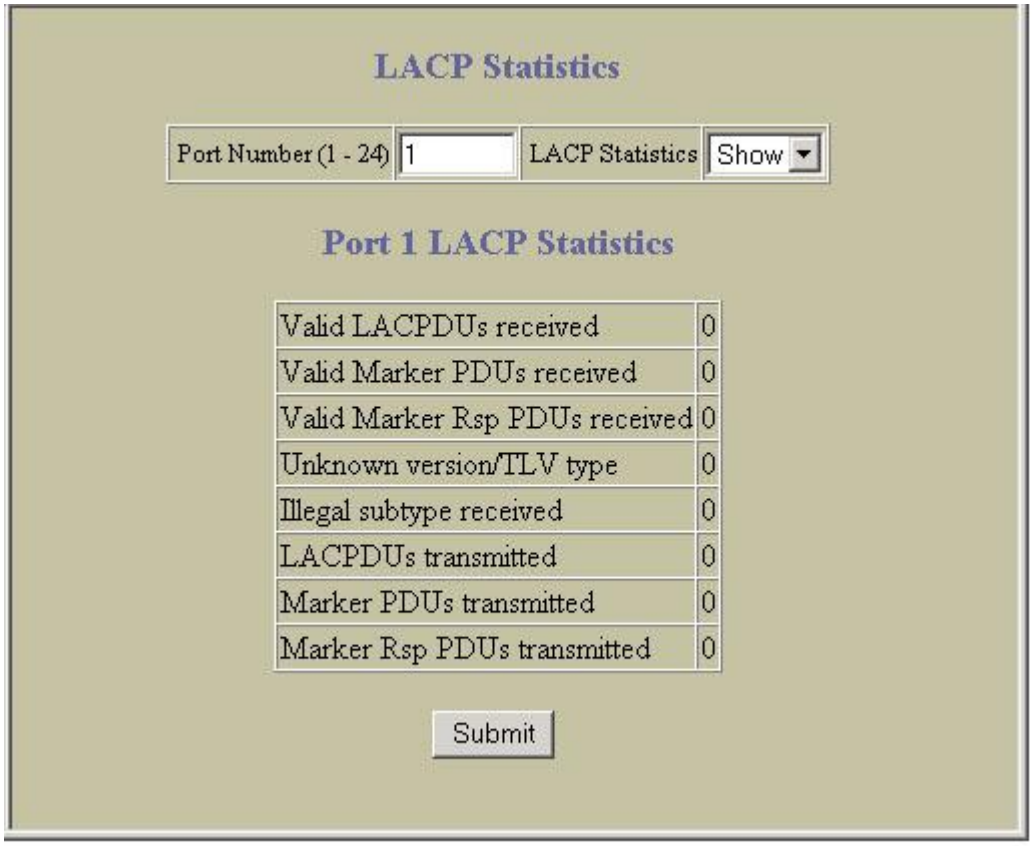
FDB statistics are described in the following table:

Table 44 Forwarding Database Statistics

Statistic	Description
Clear FDB Statistics	Select Clear and click Submit to clear FDB statistics.
current	Current number of entries in the Forwarding Database.
hiwat	Highest number of entries recorded at any given time in the Forwarding Database.

LACP Statistics

To display the following form, select Layer 2 > LACP.



Enter a port number to show LACP Statistics for the port. The following table describes LACP statistics:

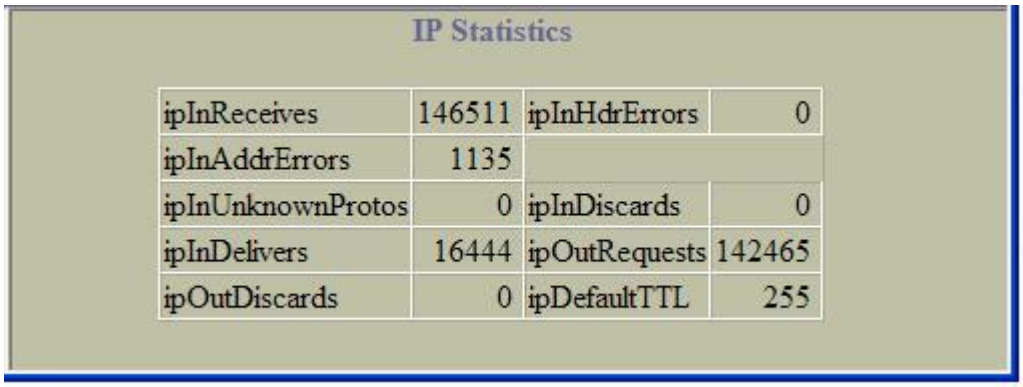
Table 45 LACP Statistics

Statistic	Description
Port	Displays the port number.
Show	Enter a port number and select Show to display LACP statistics for the port.
Valid LACPDUs received	Total number of LACP data units received.
Valid Marker PDUs received	Not applicable (see note).
Valid Marker Rsp PDUs received	Not applicable (see note).
Unknown version/TLV type	Total number of LACPDUs received with an unknown version or TLV type.
Illegal subtype received	Total number LACPDUs received with an illegal subtype.
LACPDUs transmitted	Total number of LACP data units transmitted.
Marker PDUs transmitted	Not applicable (see note).
Marker Rsp PDUs transmitted	Not applicable (see note).

NOTE: Currently, LACP implementation does not support the Churn machine, an option used to detect if the port is operable within a bounded time period between the actor and the partner. Only the Marker Responder is implemented, and there is no marker protocol generator.

IP Statistics

To display the following form, select Layer 3 > IP Interfaces (click the underlined text, not the folder).



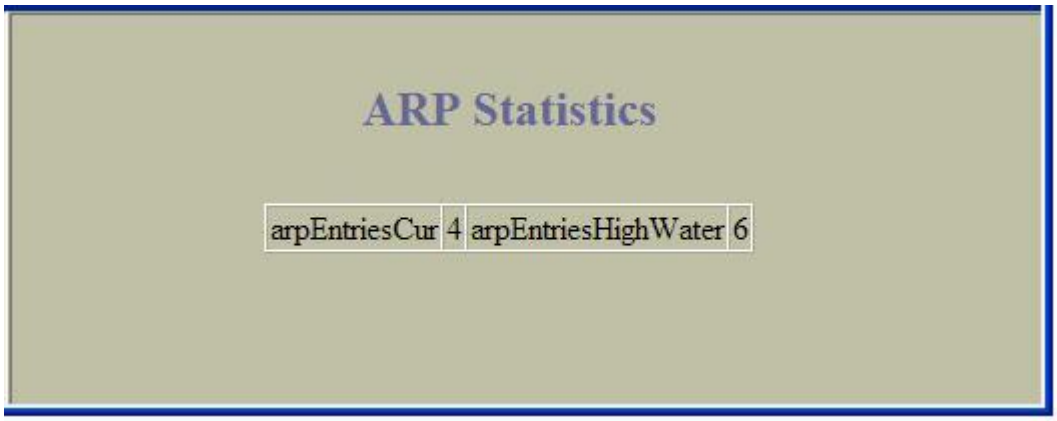
The following table describes IP statistics:

Table 46 IP Statistics

Statistic	Description
ipInReceives	The total number of input datagrams received from interfaces, including those received in error.
ipInAddrErrors	The number of input datagrams discarded because the IP address in their IP header's destination field was not a valid address to be received at this entity (the switch). This count includes invalid addresses (for example, 0.0.0.0) and addresses of unsupported Classes (for example, Class E). For entities which are not IP Gateways and therefore do not forward datagrams, this counter includes datagrams discarded because the destination address was not a local address.
ipInUnknownProtos	The number of locally addressed datagrams received successfully but discarded because of an unknown or unsupported protocol.
ipInDelivers	The total number of input datagrams successfully delivered to IP userprotocols (including ICMP).
ipOutDiscards	The number of output IP datagrams for which no problem was encountered to prevent their transmission to their destination, but which were discarded (for example, for lack of buffer space). Note that this counter would include datagrams counted in `ipForwDatagrams` if any such packets met this (discretionary) discard criterion.
ipInHdrErrors	The number of input datagrams discarded due to errors in their IP headers, including bad `checksums`, version number mismatch, other format errors, time-to-live exceeded, errors discovered in processing their IP options, and so forth.
ipInDiscards	The number of input IP datagrams for which no problems were encountered to prevent their continued processing, but which were discarded (for example, for lack of buffer space). Note that this counter does not include any datagrams discarded while awaiting re-assembly.
ipOutRequests	The total number of IP datagrams which local IP user-protocols (including ICMP) supplied to IP in requests for transmission. Note that this counter does not include any datagrams counted in `ipForwDatagrams`.
ipDefaultTTL	The default value inserted into the Time-To-Live (TTL) field of the IP header of datagrams originated at this entity (the switch), whenever a TTL value is not supplied by the transport layer protocol.

ARP Statistics

To display the following form, select Layer 3 > ARP (click the underlined text, not the folder).



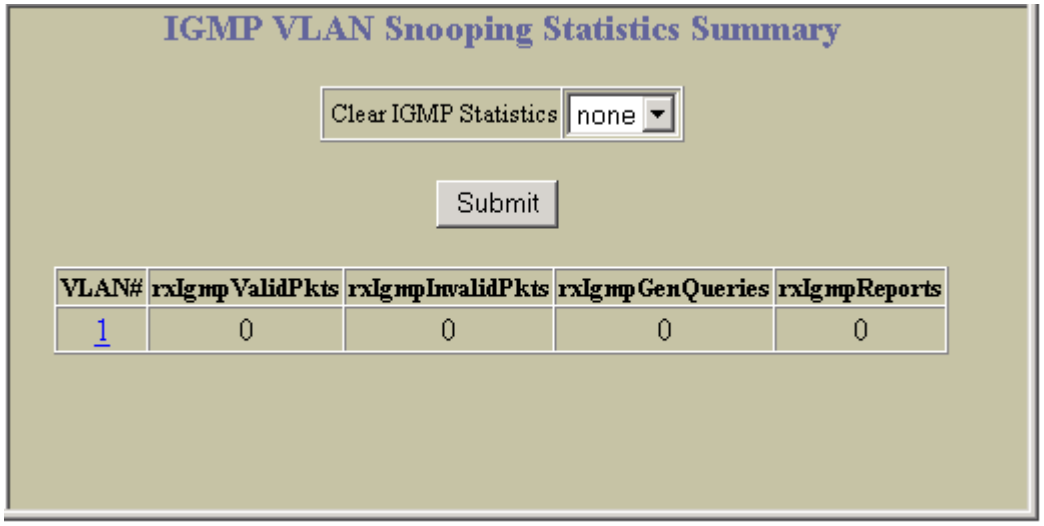
The following table describes Address Resolution Protocol (ARP) statistics:

Table 47 ARP Statistics

Statistic	Description
arpEntriesCur	The total number of outstanding ARP entries in the ARP table.
arpEntriesHighWater	The highest number of ARP entries ever recorded in the ARP table.

IGMP VLAN Snooping Statistics Summary

To display the following form, select Layer 3 > IGMP > IGMP Snooping (click the underlined text, not the folder).



The following table describes IGMP VLAN Snooping statistics:

Table 48 IGMP VLAN Snooping Statistics Summary

Statistic	Description
Clear IGMP Statistics	Select Clear and click Submit to clear all IGMP statistics.
VLAN#	Selects a VLAN.
rxIgmpValidPkts	The total number of valid IGMP packets received.
rxIgmpInvalidPkts	The total number of invalid packets received.
rxIgmpGenQueries	The total number of General Membership Query packets received.
rxIgmpReports	The total number of Membership Reports received.

VLAN - IGMP Snooping Statistics

To display the following form, go to the IGMP VLAN Snooping Statistics Summary form. Select a VLAN number.

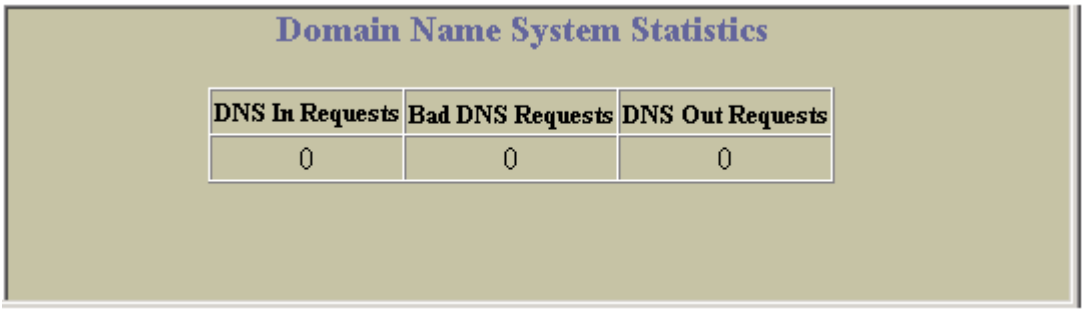
The following table describes IGMP VLAN Snooping statistics for the selected VLAN:

Table 49 VLAN - Snooping Statistics Summary

Statistic	Description
Clear IGMP VLAN x Statistics	Select Clear and click Submit to clear IGMP statistics for this VLAN.
rxIgmpValidPkts	Total number of valid IGMP packets received
rxIgmpGenQueries	Total number of General Membership Query packets received
rxIgmpInvalidPkts	Total number of invalid packets received
rxIgmpGrpSpecificQueries	Total number of Membership Query packets received from specific groups
rxIgmpLeaves	Total number of Leave requests received
rxIgmpReports	Total number of Membership Reports received
txIgmpReports	Total number of Membership reports transmitted
txIgmpGrpSpecificQueries	Total number of Membership Query packets transmitted to specific groups
txIgmpLeaves	Total number of Leave message transmitted

Domain Name System Statistics

To display the following form, select Layer 3 > Domain Name System.



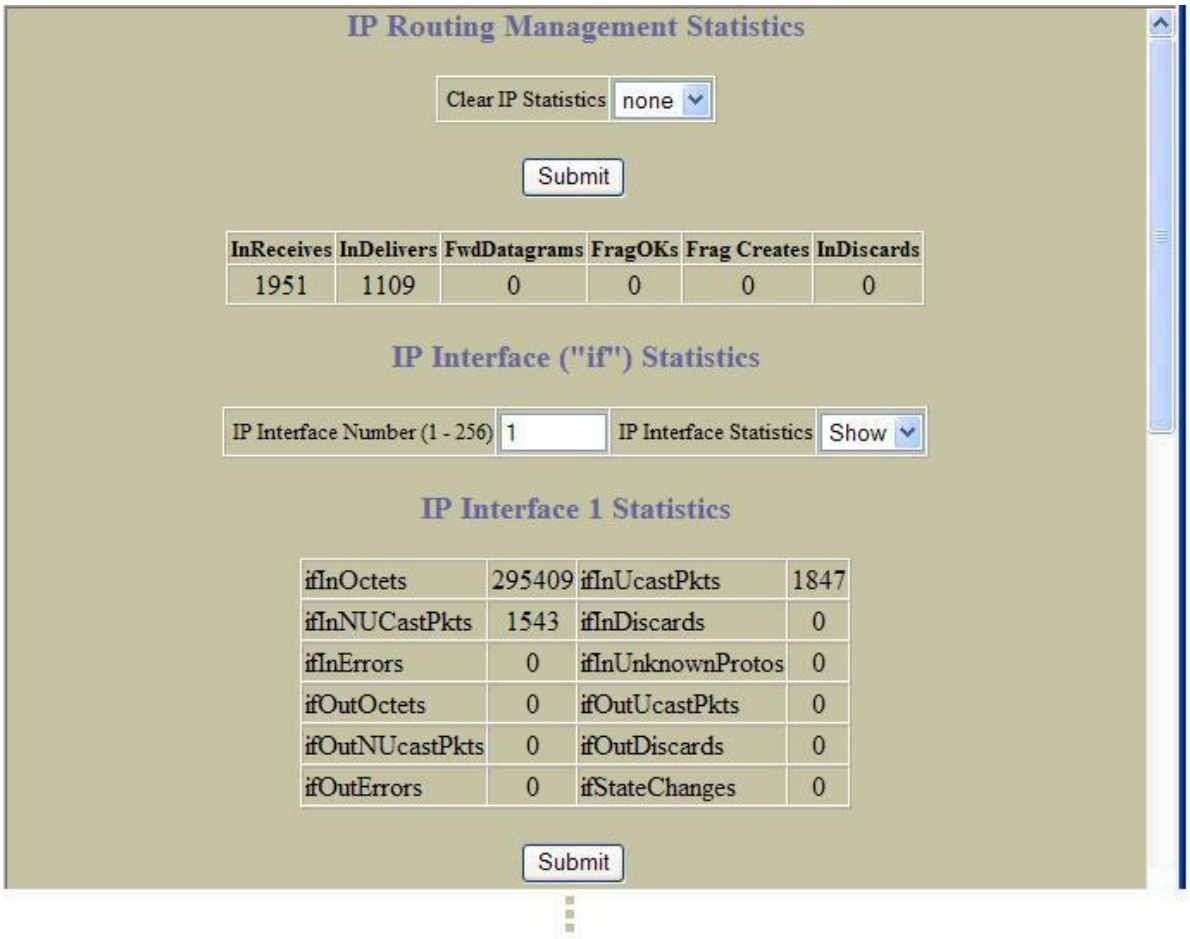
The following table describes DNS statistics:

Table 50 DNS Statistics

Statistic	Description
DNS In Requests	The total number of DNS request packets that have been received.
Bad DNS Requests	The total number of DNS request packets received that were dropped.
DNS Out Requests	The total number of DNS response packets that have been transmitted.

IP Routing Management Statistics (part one)

To display the following form, select Layer 3 > General or Layer3 > General.



The following table describes IP Routing Management statistic controls:

Table 51 IP Interface Management Statistics Controls

Statistic	Description
Clear IP statistics	Clears all IP statistics.
IP Interface Number (1-256)	Selects an interface to display statistics.
IP Interface Statistics	Select Clear and click Submit to clear statistics for the selected interface.

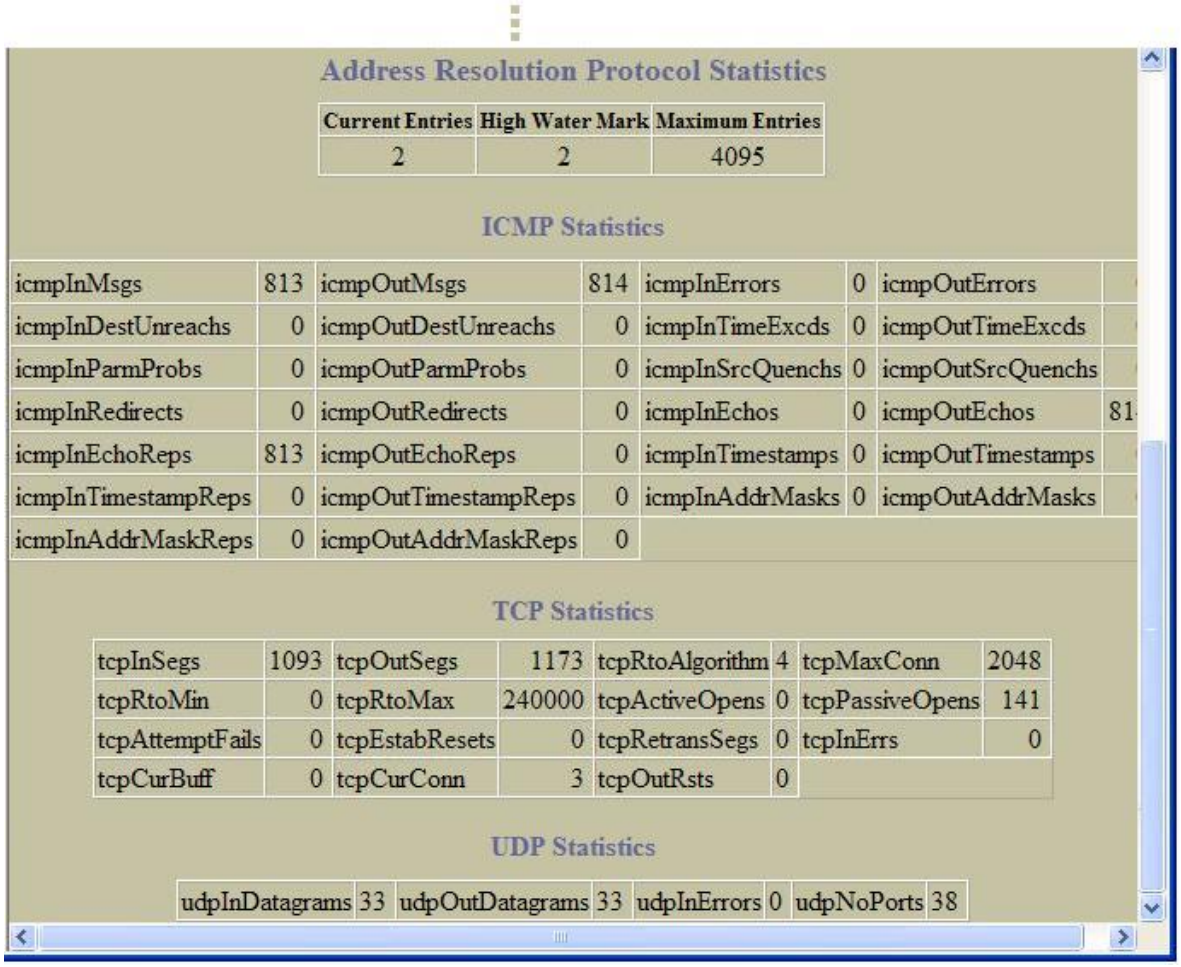
The following table describes IP Routing Management statistics for the selected interface:

Table 52 IP Routing Management Statistics

Statistic	Description
General	
InReceives	The total number of input datagrams received from interfaces, including those received in error.
InDelivers	The total number of input datagrams successfully delivered to IP user-protocols (including ICMP).
FwdDatagrams	The number of input datagrams for which this entity (the switch) was not their final IP destination, as a result of which an attempt was made to find a route to forward them to that final destination. In entities which do not act as IP Gateways, this counter will include only those packets, which were Source-Routed via this entity (the switch), and the Source- Route option processing was successful.
FragOKs	The number of IP datagrams that have been successfully fragmented at this entity (the switch).
Frag Creates	The number of IP datagram fragments that have been generated as a result of fragmentation at this entity (the switch).
InDiscards	The number of input IP datagrams for which no problems were encountered to prevent their continued processing, but which were discarded (for example, for lack of buffer space). This counter does not include any datagrams discarded while awaiting re-assembly.
IP Interface Statistics	
ifInOctets	The total number of octets received on the interface, including framing characters.
ifInNuCastPkts	The number of packets, delivered by this sublayer to a higher sublayer, which were addressed to a multicast or broadcast address at this sublayer. This object is deprecated in favor of ifInMulticastPkts and ifInBroadcastPkts.
ifInErrors	For packet-oriented interfaces, the number of inbound packets that contained errors preventing them from being delivered to a higher-layer protocol. For character-oriented or fixed-length interfaces, the number of inbound transmission units that contained errors preventing them from being deliverable to a higher-layer protocol.
ifOutOctets	The total number of octets transmitted out of the interface, including framing characters.
ifOutNucastPkts	The total number of packets that higher-level protocols requested to be transmitted, and which were addressed to a multicast or broadcast address at this sublayer, including those that were discarded or not sent. This object is deprecated in favor of ifOutMulticastPkts and ifOutBroadcastPkts.
ifOutErrors	For packet-oriented interfaces, the number of outbound packets that could not be transmitted because of errors. For character-oriented or fixed-length interfaces, the number of outbound transmission units that could not be transmitted because of errors.
ifInUcastPkts	The number of packets, delivered by this sublayer to a higher sublayer, which were not addressed to a multicast or broadcast address at this sublayer.
ifInDiscards	The number of inbound packets which were chosen to be discarded even though no errors were detected to prevent their being delivered to a higher-layer protocol. One possible reason for discarding such a packet could be to free up buffer space.
ifInUnknownProtos	The number of locally addressed datagrams received successfully but discarded because of an unknown or unsupported protocol.
ifOutUcastPkts	The total number of packets that higher-level protocols requested to be transmitted, and which were not addressed to a multicast or broadcast address at this sublayer, including those that were discarded or not sent.
ifOutDiscards	The number of outbound packets that were chosen to be discarded even though no errors had been detected to prevent their being transmitted. One possible reason for discarding such a packet could be to free up buffer space.
ifStateChanges	Total number of interface state changes.

IP Routing Management Statistics (part two)

To display the following form, select Layer 3 > General or Layer3 > General.



Address Resolution Protocol Statistics

Current Entries	High Water Mark	Maximum Entries
2	2	4095

ICMP Statistics

icmpInMsgs	813	icmpOutMsgs	814	icmpInErrors	0	icmpOutErrors	
icmpInDestUnreachs	0	icmpOutDestUnreachs	0	icmpInTimeExcds	0	icmpOutTimeExcds	
icmpInParmProbs	0	icmpOutParmProbs	0	icmpInSrcQuenchs	0	icmpOutSrcQuenchs	
icmpInRedirects	0	icmpOutRedirects	0	icmpInEchos	0	icmpOutEchos	81
icmpInEchoReps	813	icmpOutEchoReps	0	icmpInTimestamps	0	icmpOutTimestamps	
icmpInTimestampReps	0	icmpOutTimestampReps	0	icmpInAddrMasks	0	icmpOutAddrMasks	
icmpInAddrMaskReps	0	icmpOutAddrMaskReps	0				

TCP Statistics

tcpInSegs	1093	tcpOutSegs	1173	tcpRtoAlgorithm	4	tcpMaxConn	2048
tcpRtoMin	0	tcpRtoMax	240000	tcpActiveOpens	0	tcpPassiveOpens	141
tcpAttemptFails	0	tcpEstabResets	0	tcpRetransSegs	0	tcpInErrs	0
tcpCurBuff	0	tcpCurConn	3	tcpOutRsts	0		

UDP Statistics

udpInDatagrams	33	udpOutDatagrams	33	udpInErrors	0	udpNoPorts	38

The following table describes Address Resolution Protocol statistics

Table 53 ARP Statistics

Statistic	Description
Current Entries	The total number of outstanding ARP entries in the ARP table.
High Water Mark	The highest number of ARP entries ever recorded in the ARP table.
Maximum Entries	The maximum number of entries allowed in the ARP table.

ICMP statistics are described in the following table:

Table 54 ICMP Statistics

Statistic	Description
icmpInMsgs	The total number of ICMP messages which the entity (the switch) received. Note that this counter includes all those counted by `icmpInErrors`.
icmpOutMsgs	The total number of ICMP messages which this entity (the switch) attempted to send. Note that this counter includes all those counted by `icmpOutErrors`.
icmpInErrors	The number of ICMP messages that the entity (the switch) received but determined as having ICMP-specific errors (bad ICMP `checksums`, bad length, and so forth).
icmpOutErrors	The number of ICMP messages which this entity (the switch) did not send due to problems discovered within ICMP such as a lack of buffer. This value should not include errors discovered outside the ICMP layer such as the inability of IP to route the resultant datagram. In some implementations there may be no types of errors that contribute to this counter's value.
icmpInDestUnreachs	The number of ICMP Destination Unreachable messages received.
icmpOutDestUnreachs	The number of ICMP Destination Unreachable messages sent.
icmpInTimeExcds	The number of ICMP Time Exceeded messages received.
icmpOutTimeExcds	The number of ICMP Time Exceeded messages sent.
icmpInParmProbs	The number of ICMP Parameter Problem messages received.
icmpOutParmProbs	The number of ICMP Parameter Problem messages sent.
icmpInSrcQuenchs	The number of ICMP Source Quench (buffer almost full, stop sending data) messages received.
icmpOutSrcQuenchs	The number of ICMP Source Quench (buffer almost full, stop sending data) messages sent.
icmpInRedirects	The number of ICMP Redirect messages received.
icmpOutRedirects	The number of ICMP Redirect messages sent. For a host, this object will always be zero, since hosts do not send redirects.
icmpInEchos	The number of ICMP Echo (request) messages received.
icmpOutEchos	The number of ICMP Echo (request) messages sent.
icmpInEchoReps	The number of ICMP Echo Reply messages received.
icmpOutEchoReps	The number of ICMP Echo Reply messages sent.
icmpInTimestamps	The number of ICMP Timestamp (request) messages received.
icmpOutTimestamps	The number of ICMP Timestamp (request) messages sent.
icmpInTimestampReps	The number of ICMP Timestamp `Reply` messages received.
icmpOutTimestampReps	The number of ICMP Timestamp `Reply` messages sent.
icmpInAddrMasks	The number of ICMP Address Mask Request messages received.
icmpOutAddrMasks	The number of ICMP Address Mask Request messages sent.
icmpInAddrMaskReps	The number of ICMP Address Mask Reply messages received.
icmpOutAddrMaskReps	The number of ICMP Address Mask Reply messages sent.

TCP statistics are described in the following table:

Table 55 TCP Statistics

Statistic	Description
tcpInSegs	The total number of segments received, including those received in error. This count includes segments received on currently established connections.
tcpOutSegs	The total number of segments sent, including those on current connections, but excluding those containing only retransmitted octets.
tcpRtoAlgorithm	The algorithm used to determine the timeout value used for retransmitting unacknowledged octets.
tcpMaxConn	The limit on the total number of TCP connections the entity (the switch) can support. In entities where the maximum number of connections is dynamic, this object should contain the value -1.
tcpRtoMin	The minimum value permitted by a TCP implementation for the retransmission timeout, measured in milliseconds. More refined semantics for objects of this type depend upon the algorithm used to determine the retransmission timeout. In particular, when the timeout algorithm is rsre(3), an object of this type has the semantics of the LBOUND quantity described in RFC 793.
tcpRtoMax	The maximum value permitted by a TCP implementation for the retransmission timeout, measured in milliseconds. More refined semantics for objects of this type depend upon the algorithm used to determine the retransmission timeout. In particular, when the timeout algorithm is rsre(3), an object of this type has the semantics of the UBOUND quantity described in RFC 793.
tcpActiveOpens	The number of times TCP connections have made a direct transition to the SYN-SENT state from the CLOSED state.
tcpPassiveOpens	The number of times TCP connections have made a direct transition to the SYN-RCVD state from the LISTEN state.
tcpAttemptFails	The number of times TCP connections have made a direct transition to the CLOSED state from either the SYN-SENT state or the SYNRCVD state, plus the number of times TCP connections have made a direct transition to the LISTEN state from the SYN-RCVD state.
tcpEstabResets	The number of times TCP connections have made a direct transition to the CLOSED state from either the ESTABLISHED state or the CLOSE-WAIT state.
tcpRetransSegs	The total number of segments retransmitted - that is, the number of TCP segments transmitted containing one or more previously transmitted octets.
tcpInErrs	The total number of segments received in error (for example, bad TCP checksums).
tcpCurBuff	The total number of outstanding memory allocations from heap by TCP protocol stack.
tcpCurConn	The total number of outstanding TCP sessions that are currently opened.
tcpOutRsts	The number of TCP segments sent containing the RST flag.

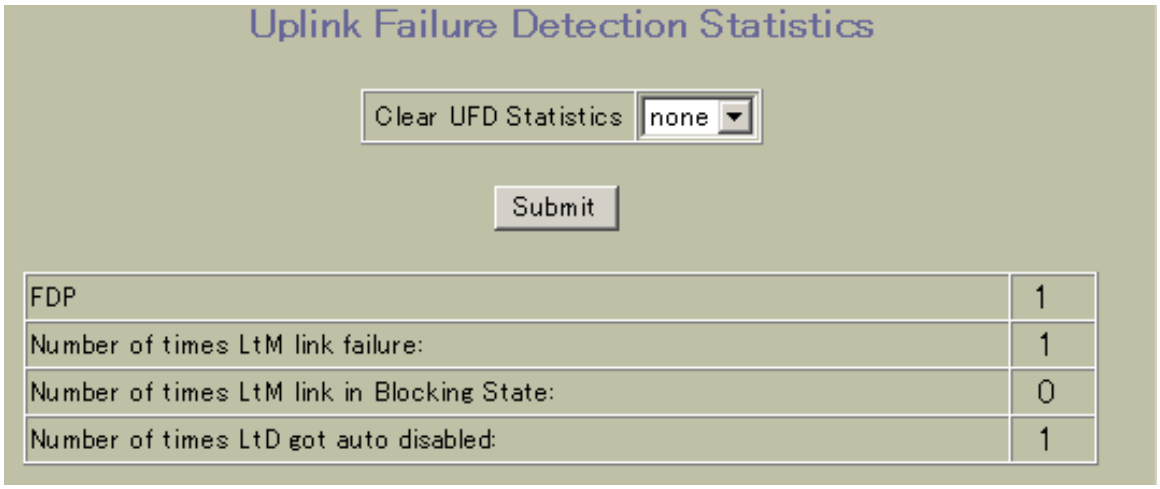
UDP statistics are described in the following table:

Table 56 UDP Statistics

Statistic	Description
udpInDatagrams	The total number of UDP datagrams delivered to the switch.
udpOutDatagrams	The total number of UDP datagrams sent from this entity (the switch).
udpInErrors	The number of received UDP datagrams that could not be delivered for reasons other than the lack of an application at the destination port.
udpNoPorts	The total number of received UDP datagrams for which there was no application at the destination port.

Uplink Failure Detection Statistics

To display the following form, select Uplink Failure Detection (click the underlined text, not the folder).



The following table describes commands for Uplink Failure Detection (UFD) statistics:

Table 57 Uplink Failure Detection Statistics

Control	Description
Clear UFD Statistics	To clear UFD statistics, select `clear` in the drop-down list, and click Submit.
FDP	The number of the Failure Detection Pair.
Number of times LtM link failure	The total number of times that link failures were detected on the uplink ports in the Link to Monitor group.
Number of times LtM link in Blocking State	The total number of times that Spanning Tree Blocking state was detected on the uplink ports in the Link to Monitor group.
Number of times LtD got auto disabled	The total number of times that downlink ports in the Link to Disable group were automatically disabled because of a failure in the Link to Monitor group.

Configuring the switch

Introduction

The switch BBI can be used to view and change switch configuration parameters. The same configuration parameters that are available through the switch's command-line interface are present on the BBI configuration forms.

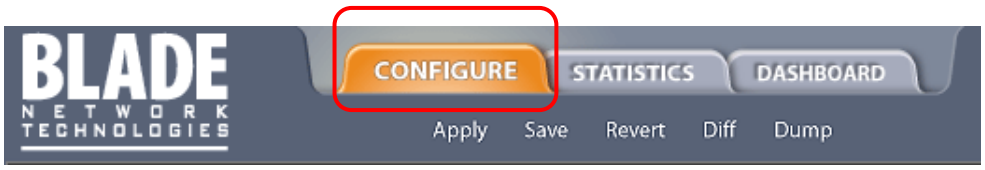
The following provides a basic outline for switch configuration. You should first be familiar with configuration as covered in the *Command Reference Guide*.

IMPORTANT: You must be logged in using the administrator account in order to change switch configuration settings.

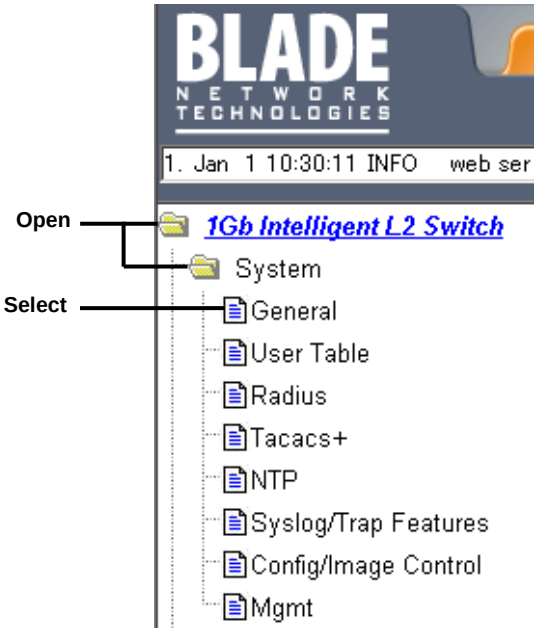
Configuration steps

Follow these basic steps for viewing or configuring switch parameters:

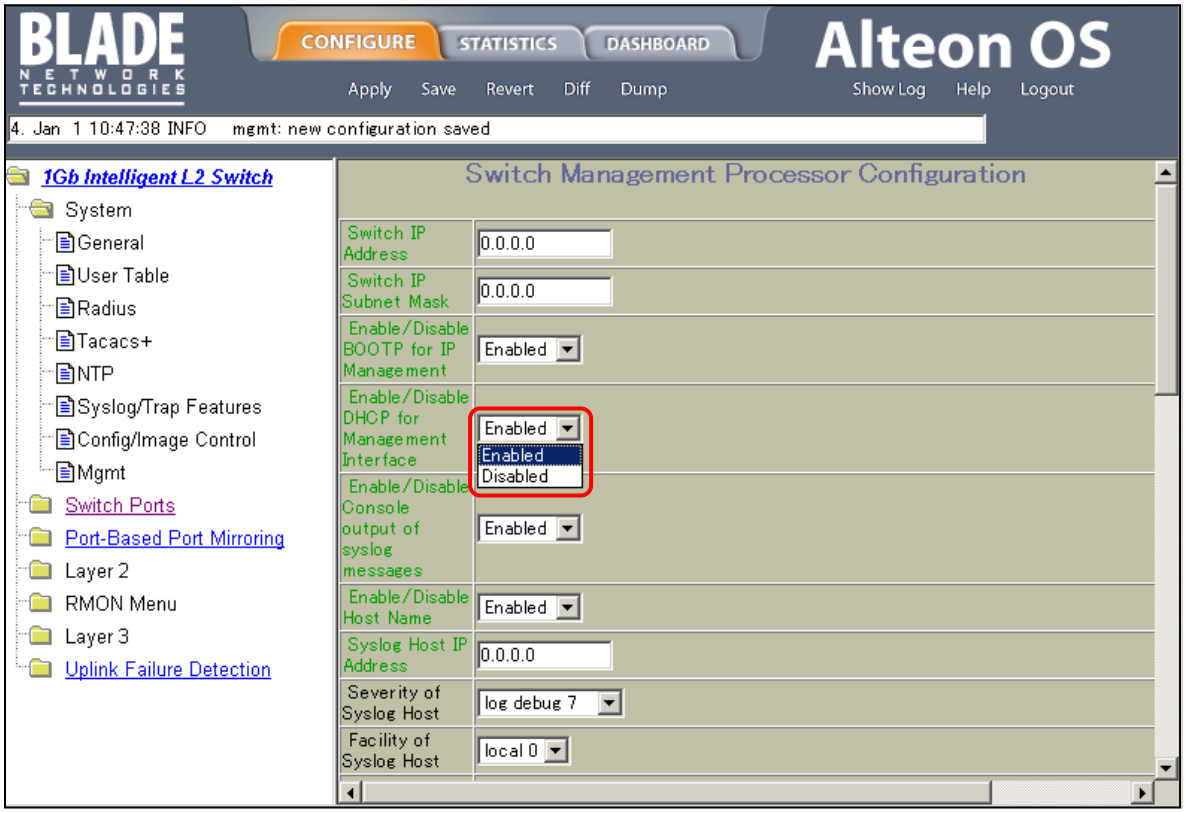
1. Select the Configure context button in the toolbar.



2. Select a feature icon in the navigation window. For example:



3. View or make changes to the settings shown in the forms window. For example:

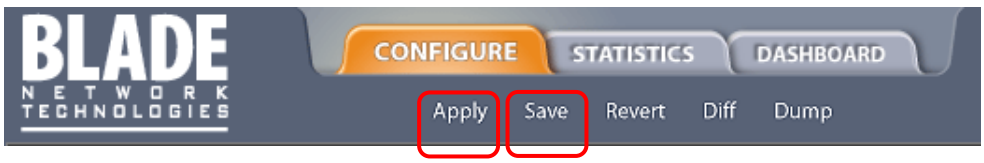


NOTE: Some fields are highlighted on the forms in green type—they must be configured for proper switch operations. Underlined items load other forms when selected.

4. Submit the form contents using the button on the bottom of the form.

Button	Description
Submit	When selected, the form is sent to the switch. Any configuration changes are placed in the "pending" state and do not take effect until the toolbar Apply command is given.

5. Apply and save your changes using the toolbar commands.



Pending configuration changes (including deletions) do not take effect until the Apply command is selected. You can view pending changes on the Configuration form, but they do not appear on the Dashboard. The Dashboard displays the current active (applied) configuration.

Applied changes take effect on the switch immediately, but are lost the next time the switch is rebooted, unless the Save command is selected. When you click Save, you have two save options: Save and Save n. With Save, your new configuration changes are placed in the active configuration block. The previous configuration is copied into the backup configuration block. If you select Save n, your new configuration changes are placed in the active configuration block, and the backup configuration block remains unchanged.

Input error checking

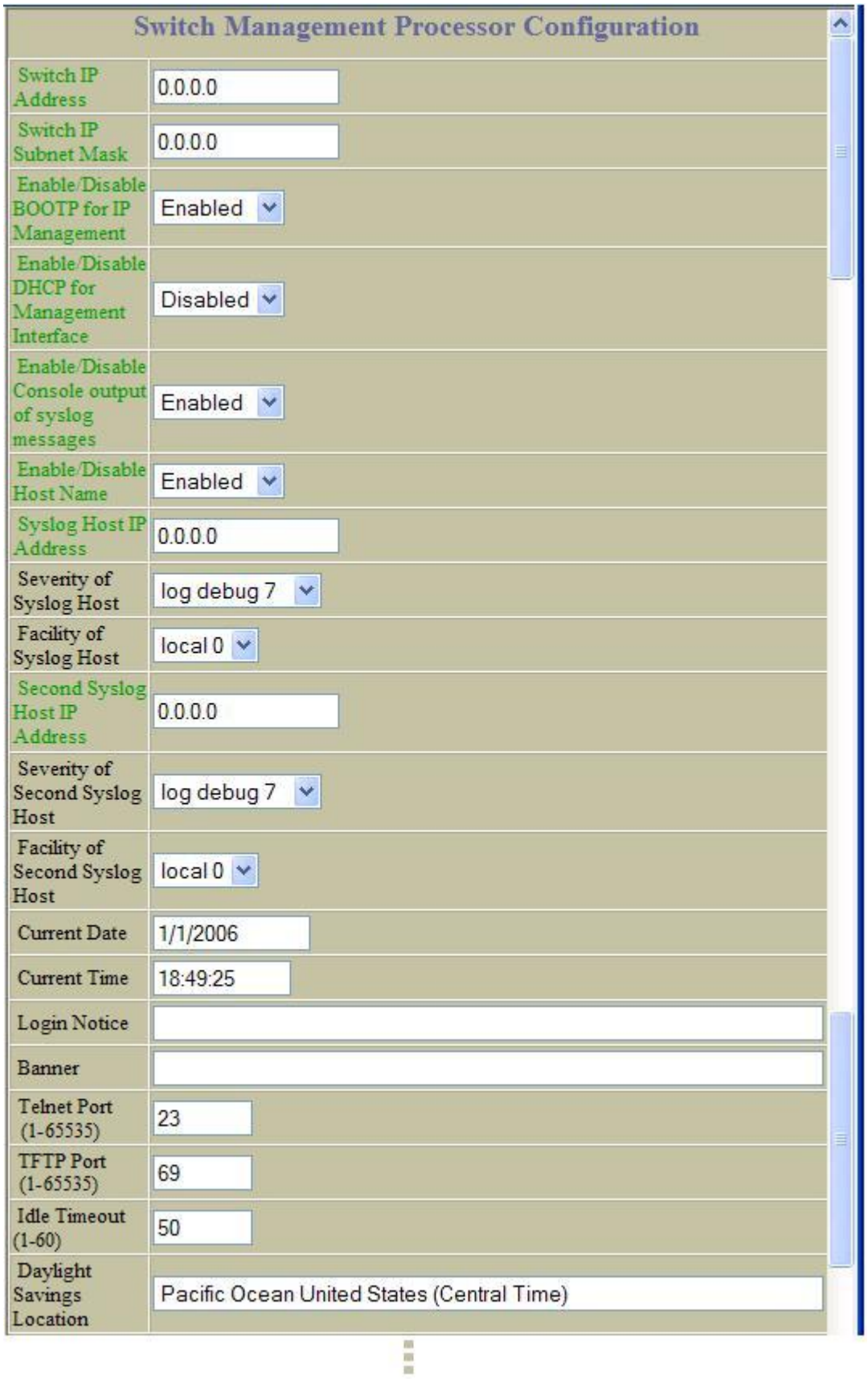
The BBI performs two levels of input error-checking, as follows:

- Submit: When you click Submit on a Configuration form, the BBI checks the format and range of pending configuration changes. For example, if you enter a value that is out of range (VLAN = 8097), a log error is generated.
- Apply: When you click Apply to make pending changes active, the switch checks the validity of pending configuration changes. For example, an invalid MIB OID can pass the format check during Submit, if the format is correct. The invalid OID is rejected when you attempt to apply the configuration.

Switch Management Processor Configuration

Basic system configuration

To display the following form, select System > General.



Switch Management Processor Configuration	
Switch IP Address	0.0.0.0
Switch IP Subnet Mask	0.0.0.0
Enable/Disable BOOTP for IP Management	Enabled
Enable/Disable DHCP for Management Interface	Disabled
Enable/Disable Console output of syslog messages	Enabled
Enable/Disable Host Name	Enabled
Syslog Host IP Address	0.0.0.0
Severity of Syslog Host	log debug 7
Facility of Syslog Host	local 0
Second Syslog Host IP Address	0.0.0.0
Severity of Second Syslog Host	log debug 7
Facility of Second Syslog Host	local 0
Current Date	1/1/2006
Current Time	18:49:25
Login Notice	
Banner	
Telnet Port (1-65535)	23
TFTP Port (1-65535)	69
Idle Timeout (1-60)	50
Daylight Savings Location	Pacific Ocean United States (Central Time)

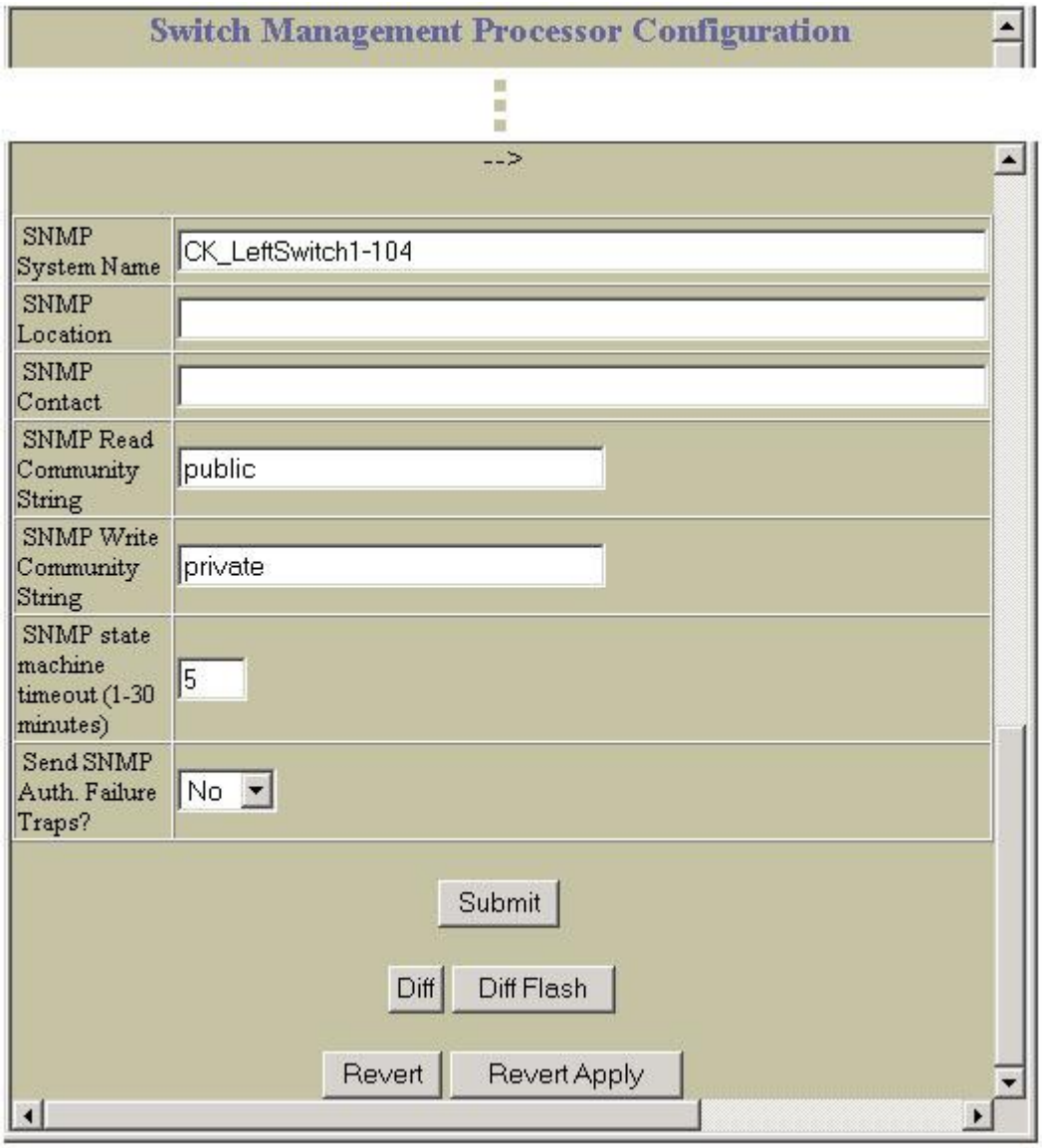
The following table describes the Switch Management Processor Configuration (basic) controls:

Table 58 Switch Management Processor Configuration (Basic) controls

Control	Description
Switch IP Address	Configures the IP address of the switch interface using dotted decimal notation.
Switch IP Subnet Mask	Configures the IP subnet address mask for the interface using dotted decimal notation.
Enable/Disable BOOTP for IP Management	Enables or disables the use of `BOOTP`. If you enable `BOOTP`, the switch will query its `BOOTP` server for all of the switch IP parameters. This command is enabled by default.
Enable/Disable DHCP for Management Interface	Enables or disables Dynamic Host Control Protocol for setting the management IP address.
Enable/Disable Console output of syslog messages	Enables or disables delivering syslog messages to the console. When necessary, disabling console ensures the switch is not affected by syslog messages. It is enabled by default.
Enable/Disable Host Name	Enables or disables displaying of the host name (system administrator's name) in the Command Line Interface (CLI). It is disabled by default.
Syslog Host IP Address	Sets the IP address of the first syslog host.
Severity of Syslog Host	This option sets the severity level of the first syslog host displayed. The default is 7, which means log all the seven severity levels.
Facility of Syslog Host	This option sets the facility level of the first syslog host displayed. The default is 0.
Second Syslog Host IP Address	Sets the IP address of the second syslog host.
Severity of Second Syslog Host	This option sets the severity level of the second syslog host displayed. The default is 7, which means, log all seven severity levels.
Facility of Second Syslog Host	This option sets the facility level of the second syslog host displayed. The default is 0.
Current Date	Configures the system date.
Current Time	Configures the system time using a 24-hour clock format.
Login Notice	Displays login notice immediately before the "Enter password:" prompt in the Command Line Interface (CLI). This notice can contain up to 1024 characters and new lines.
Banner	Configures a login banner of up to 80 characters. When a user or administrator logs into the switch Command Line Interface (CLI), the login banner is displayed. It is also displayed as part of the output from the `/info/sys/gen` command.
Telnet Port (1-65535)	Sets an optional telnet server port number for cases where the server listens for telnet sessions on a non-standard port. The default is 23.
TFTP Port (1-65535)	Sets an optional TFTP server port number for cases where the server listens for TFTP sessions on a non-standard port. The default is 69.
Idle Timeout (1-60)	Sets the idle timeout for CLI sessions, from 1 to 60 minutes. The default is 5 minutes.
Daylight Savings Location	Configures the time zone where the switch resides. You are prompted to select your location (continent, country, region) by the timezone wizard. Once a region is selected, the switch updates the time to reflect local changes to Daylight Savings Time, etc.
Enable/Disable Daylight Savings Time	Disables or enables daylight savings time in the system clock. When enabled, the switch will add an extra hour to the system clock so that it is consistent with the local clock. By default, this option is disabled.

SNMP controls

To display the following form, select System > General.



The following table describes the Switch Management Processor Configuration (SNMP) controls:

Table 59 Switch Management Processor Configuration (SNMP) controls

Control	Description
SNMP System Name	Configures the name for the system. The name can have a maximum of 64 characters.
SNMP Location	Configures the name of the system location. The location can have a maximum of 64 characters.
SNMP Contact	Configures the name of the system contact. The contact can have a maximum of 64 characters.
SNMP Read Community String	Configures the SNMP read community string. The read community string controls SNMP “get” access to the switch. It can have a maximum of 32 characters. The default read community string is public.
SNMP Write Community String	Configures the SNMP write community string. The write community string controls SNMP “set” and “get” access to the switch. It can have a maximum of 32 characters. The default write community string is private.
SNMP state machine timeout (1-30 minutes)	Sets the timeout value for the SNMP state machine. The default is 5 minutes.
Send SNMP Auth. Failure Traps?	Enables or disables the use of the system authentication trap facility. The default setting is disabled.

Switch Management Processor Configuration buttons

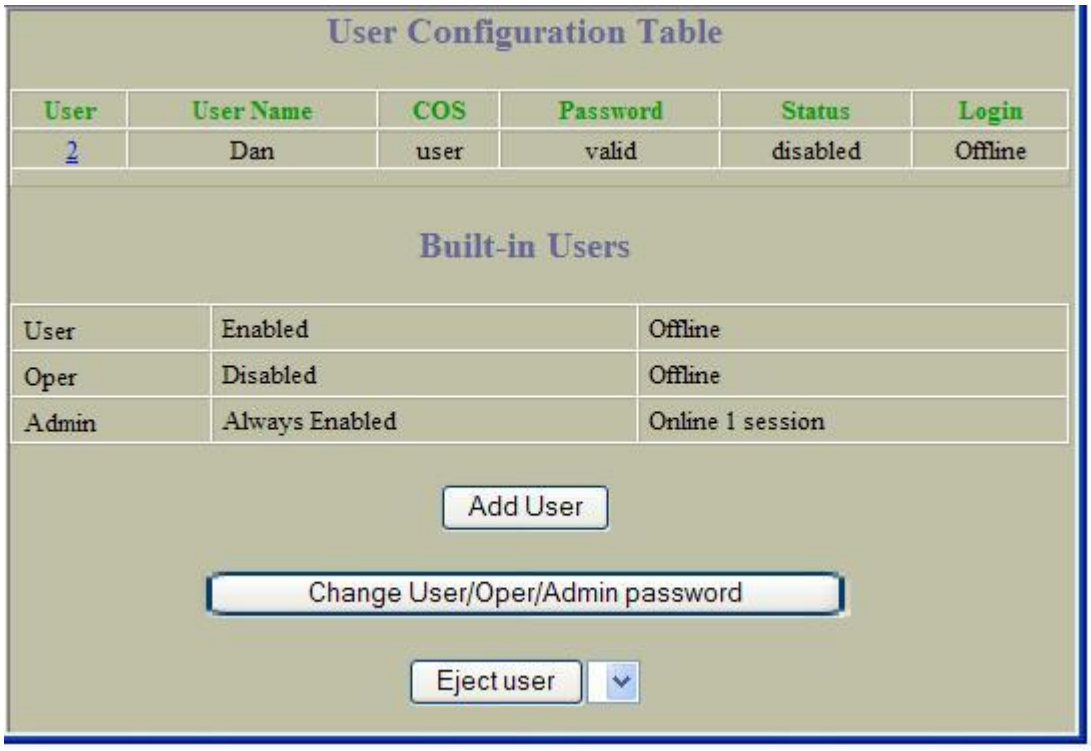
The following table describes the Switch Management Processor Configuration buttons:

Table 60 Switch Management Processor Configuration buttons

Control	Description
Submit	Sends this form to the switch. Any configuration changes are placed in the “pending” state and do not take effect until the toolbar Apply command is given.
Diff	Shows any pending configuration changes.
Diff Flash	Compares new configuration with the flash configuration.
Revert	Removes pending configuration changes between apply commands. Use this command to restore configuration parameters set since last apply command.
Revert Apply	Removes pending configuration changes between save commands. Use this command to restore configuration parameters set since last save command.

User Configuration Table

To display the following form, select System > User Table.

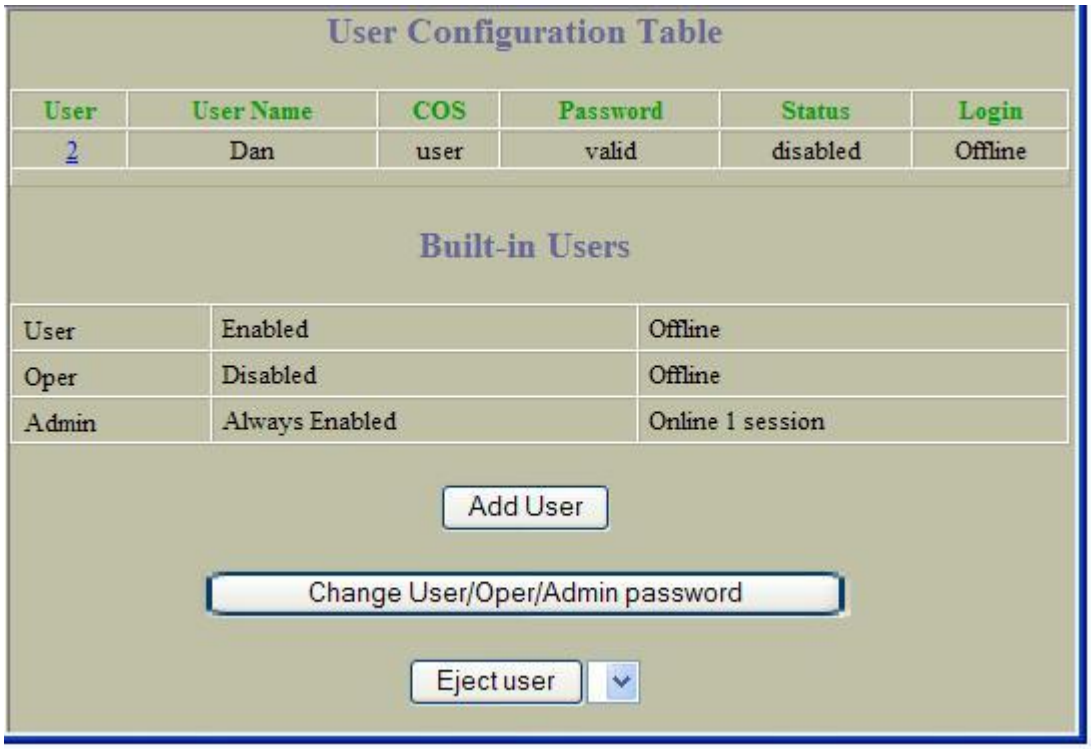


This form summarizes the users configured on the switch. Click Add User to define a new user. Click Change User/Oper/Admin password to configure new passwords for the switch.

To remove an end-user from switch, select the user ID and click Eject user.

User Access Control Configuration

To display the following form, go to the User Configuration Table and click Add User.



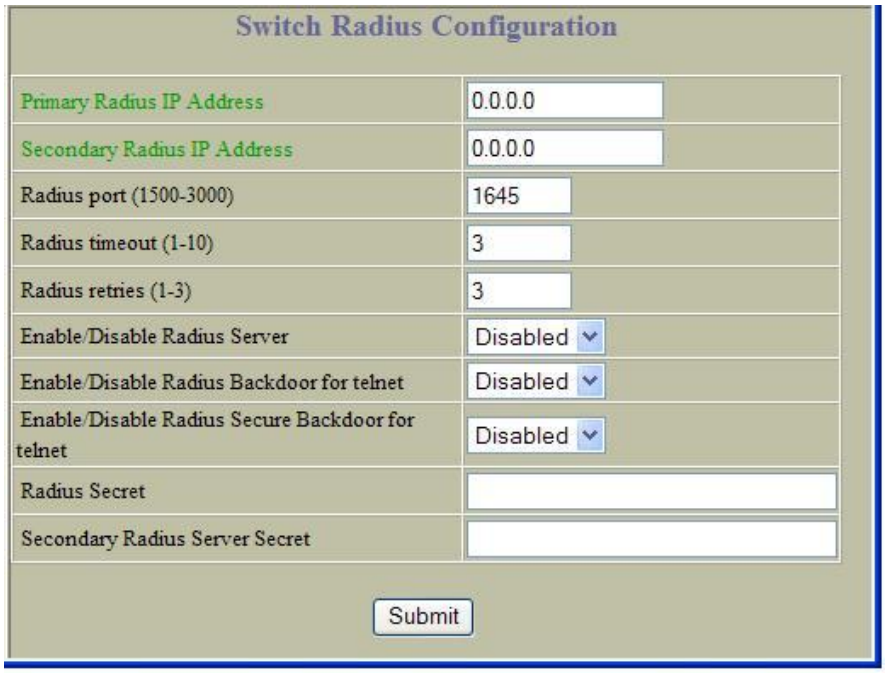
The following table describes User Access Configuration controls:

Table 61 User Access Configuration controls

Control	Description
User ID (1-10)	Sets a numeric identifier for the user.
Set Class of Service	Sets the Class-of-Service to define the user's authority level.
Set user name (1-8 chars)	Defines the user name of maximum eight characters.
Set user password (1-128 chars)	Sets the user password of up to 128 characters maximum.
Re-type user password (1-128 chars)	Confirms the user password.
Enter current admin password	Sets the current admin password.
User Status	Enables or disables the user.

Switch RADIUS Configuration

To display the following form, select System > Radius.



The following table describes Switch Radius Configuration controls:

Table 62 Switch RADIUS Configuration controls

Control	Description
Primary Radius IP Address	Configures the primary Radius server address.
Secondary Radius IP Address	Configures the secondary Radius server address.
Radius port (1500-3000)	Configures the number of the UDP port to be configured, between 1500 - 3000. The default is 1645.
Radius timeout (1-10)	Configures the amount of time, in seconds, before a Radius server authentication attempt is considered to have failed. The default is 3 seconds.
Radius retries (1-3)	Configures the number of failed authentication requests before switching to a different Radius server. The default is 3 requests.
Enable/Disable Radius Server	Enables or disables the Radius server.
Enable/Disable Radius Backdoor for telnet	Enables or disables the RADIUS backdoor for telnet. Telnet also applies to SSH/SCP/HTTP/HTTPS connections.
Enable/Disable Radius Secure Backdoor for telnet	Enables or disables the RADIUS back door using secure password for telnet/SSH/ HTTP/HTTPS.
Radius Secret	Defines the shared secret (up to 32 characters) between the switch and the RADIUS server(s).
Secondary Radius Server Secret	Defines the secondary shared secret (up to 32 characters) between the switch and the Radius server(s).

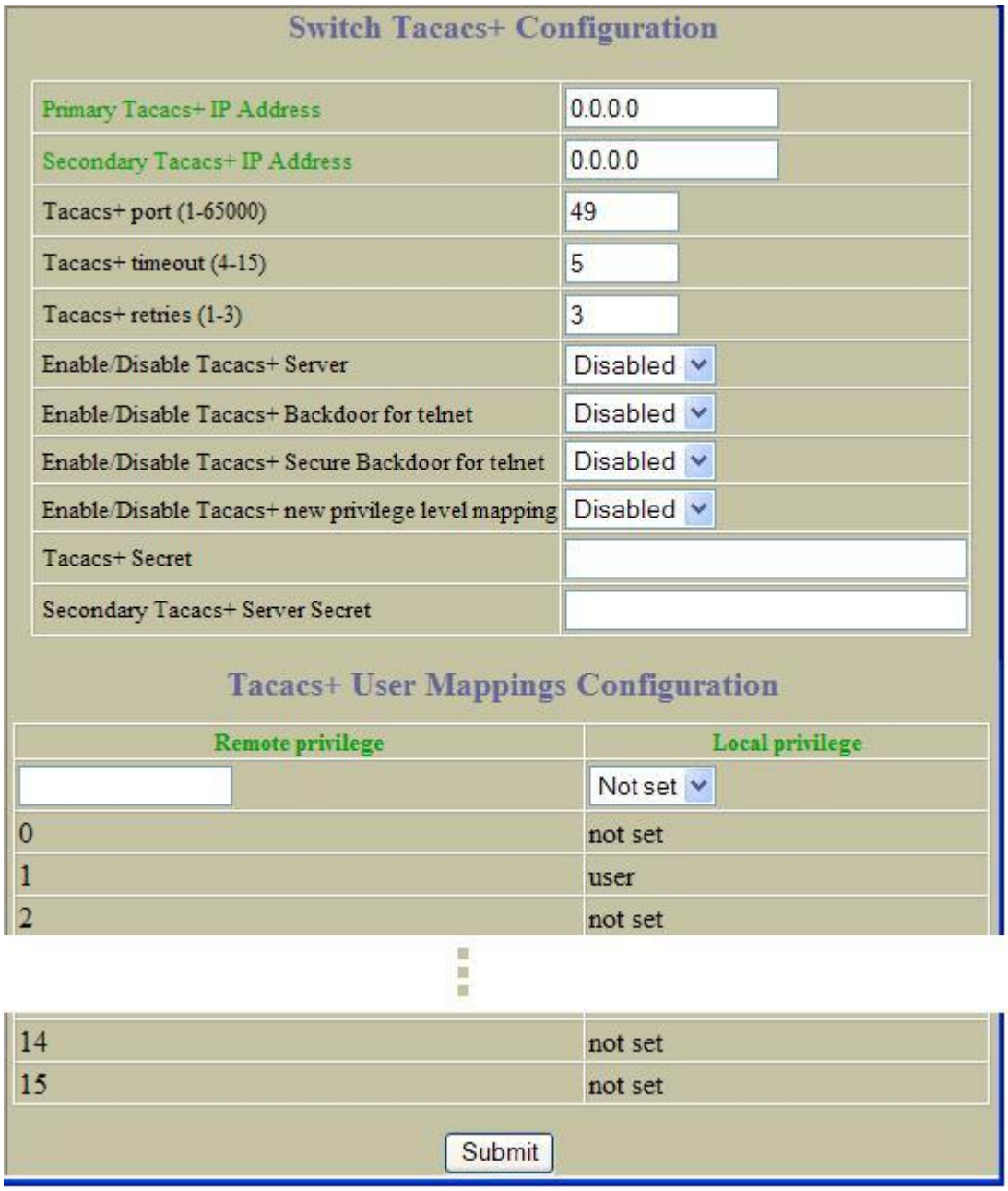
IMPORTANT: If RADIUS is enabled, you must login using RADIUS authentication when connecting via the console or Telnet/SSH/HTTP/HTTPS. Backdoor for console is always enabled, so you can connect using noradius and the administrator password even if the backdoor (`telnet`) or secure backdoor (`secbd`) are disabled.

If Telnet backdoor is enabled (`telnet ena`), type in `noradius` as a backdoor to bypass RADIUS checking, and use the administrator password to log into the switch. The switch allows this even if RADIUS servers are available.

If secure backdoor is enabled (`secbd ena`), type in `noradius` as a backdoor to bypass RADIUS checking, and use the administrator password to log into the switch. The switch allows this only if RADIUS servers are not available.

Switch TACACS+ Configuration

To display the following form, select System > Tacacs+.



TACACS+ (Terminal Access Controller Access Control System) is an authentication protocol that allows a remote access server to forward a user's logon password to an authentication server to determine whether access can be allowed to a given system. TACACS+ and Remote Authentication Dial-In User Service (RADIUS) protocols are more secure than the TACACS encryption protocol. TACACS+ is described in RFC 1492.

TACACS+ protocol is more reliable than RADIUS, as TACACS+ uses the Transmission Control Protocol (TCP) whereas RADIUS uses the User Datagram Protocol (UDP). Also, RADIUS combines authentication and authorization in a user profile, whereas TACACS+ separates the two operations.

TACACS+ offers the following advantages over RADIUS as the authentication device:

- TACACS+ is TCP-based, so it facilitates connection-oriented traffic.
- It supports full-packet encryption, as opposed to password-only in authentication requests.
- It supports decoupled authentication, authorization, and accounting.

The following table describes Switch TACACS+ Configuration controls:

Table 63 Switch TACACS+ Configuration controls

Control	Description
Primary Tacacs+ IP Address	Configures the primary TACACS+ server address.
Secondary Tacacs+ IP Address	Configures the secondary TACACS+ server address.
Tacacs+ port (1-65000)	Configures the number of the TCP port to be configured, between 1 and 65000. The default is 49.
Tacacs+ timeout (4-15)	Configures the amount of time, in seconds, before a TACACS+ server authentication attempt is considered to have failed. The default timeout is 5 seconds.
Tacacs+ retries (1-3)	Configures the number of failed authentication requests before switching to a different TACACS+ server. The default retry count is 3 requests.
Enable/Disable Tacacs+ Server	Enables or disables the Tacacs+ server.
Enable/Disable Tacacs+ Backdoor for telnet	Enables or disables the Tacacs+ backdoor for telnet. Telnet also applies to SSH/SCP connections.
Enable/Disable Tacacs+ new privilege level mapping	Enables or disables TACACS+ privilege-level mapping. The default value is `disabled`.
Tacacs+ Secret	Configures the shared secret (up to 32 characters) between the switch and the TACACS+ server.
Secondary Tacacs+ Server Secret	Configures the secondary shared secret (up to 32 characters) between the switch and the TACACS+ server.
Tacacs+ User Mappings Configuration	Maps a TACACS+ privilege level to this switch user level, as follows: Remote Privilege Enter a TACACS+ privilege level (0-15) Local Privilege Select the corresponding this switch user level.

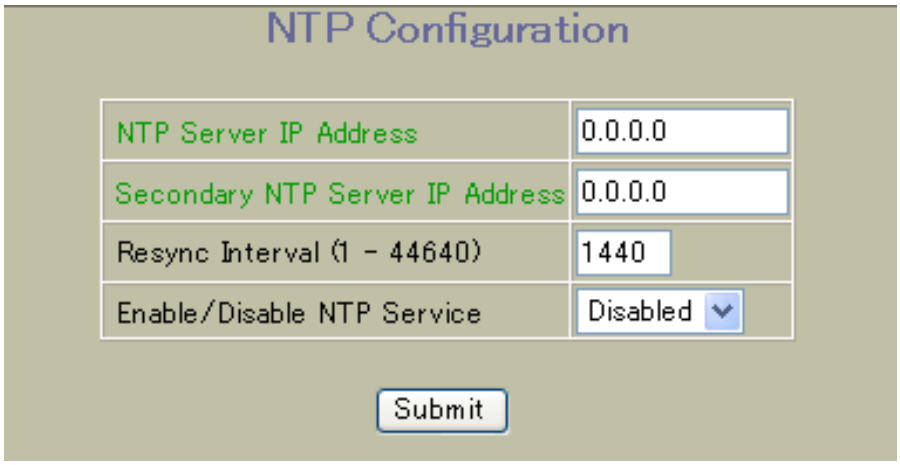
IMPORTANT: If TACACS+ is enabled, you must login using TACACS+ authentication when connecting via the console or Telnet/SSH/HTTP/HTTPS. Backdoor for console is always enabled, so you can connect using noradius and the administrator password even if the backdoor (`telnet`) or secure backdoor (`secbd`) are disabled.

If Telnet backdoor is enabled (`telnet ena`), type in `noradius` as a backdoor to bypass TACACS+ checking, and use the administrator password to log into the switch. The switch allows this even if TACACS+ servers are available.

If secure backdoor is enabled (`secbd ena`), type in `noradius` as a backdoor to bypass TACACS+ checking, and use the administrator password to log into the switch. The switch allows this only if TACACS+ servers are not available.

NTP Configuration

To display the following form, select System > NTP.



This form enables you to synchronize the switch clock to a Network Time Protocol (NTP) server. By default, this option is disabled.

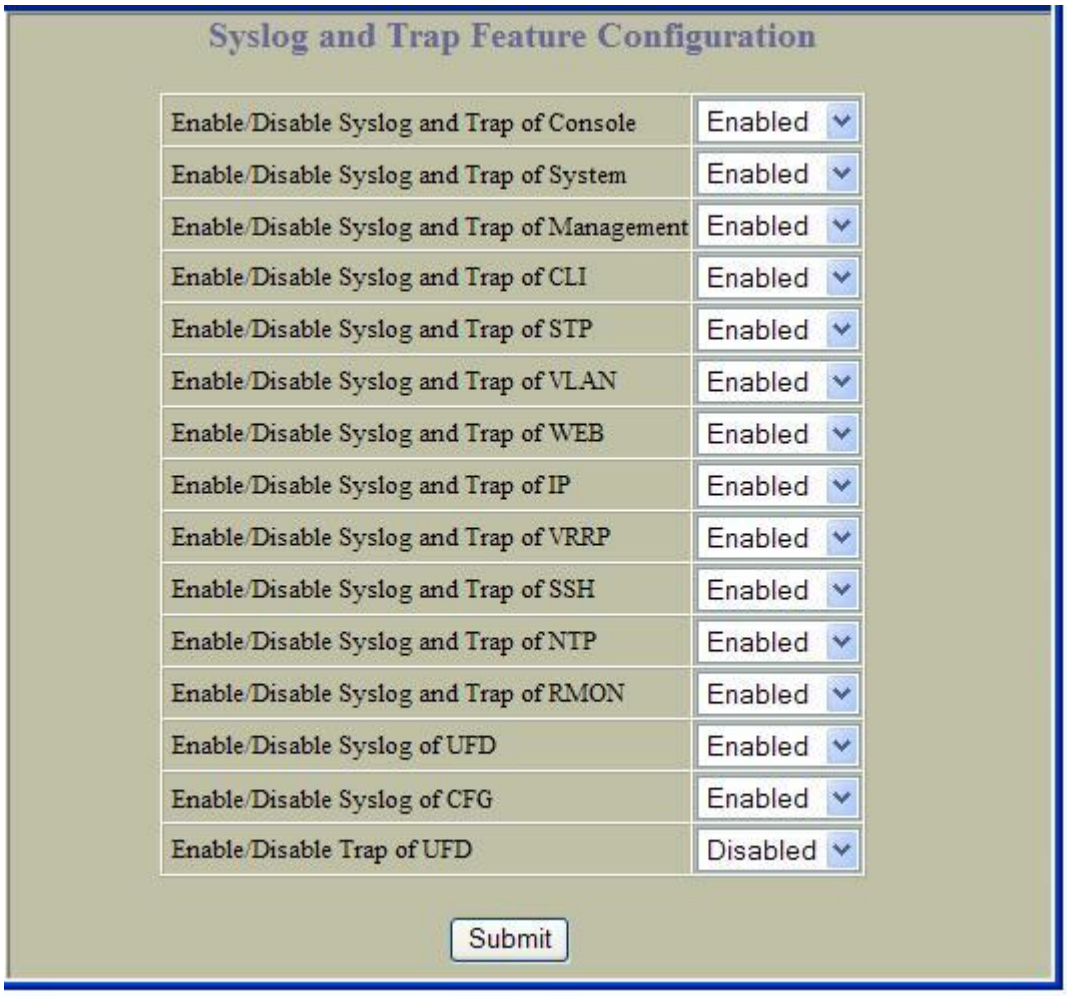
The following table describes NTP Configuration controls:

Table 64 NTP Configuration controls

Control	Description
NTP Server IP Address	Configures the IP address of the primary NTP server to which you want to synchronize the switch clock.
Secondary NTP Server IP Address	Configures the IP address of the secondary NTP server to which you want to synchronize the switch clock.
Resync Interval (1-44640)	Specifies the interval, that is, how often, in minutes (1-44640), to re-synchronize the switch clock with the NTP server.
Enable/Disable NTP Service	Enables or disables the NTP synchronization service.

Syslog and Trap Feature Configuration

To display the following form, select System > Syslog/Trap Features.



The following table describes Syslog and Trap Feature Configuration controls:

Table 65 Syslog and Trap Feature Configuration controls

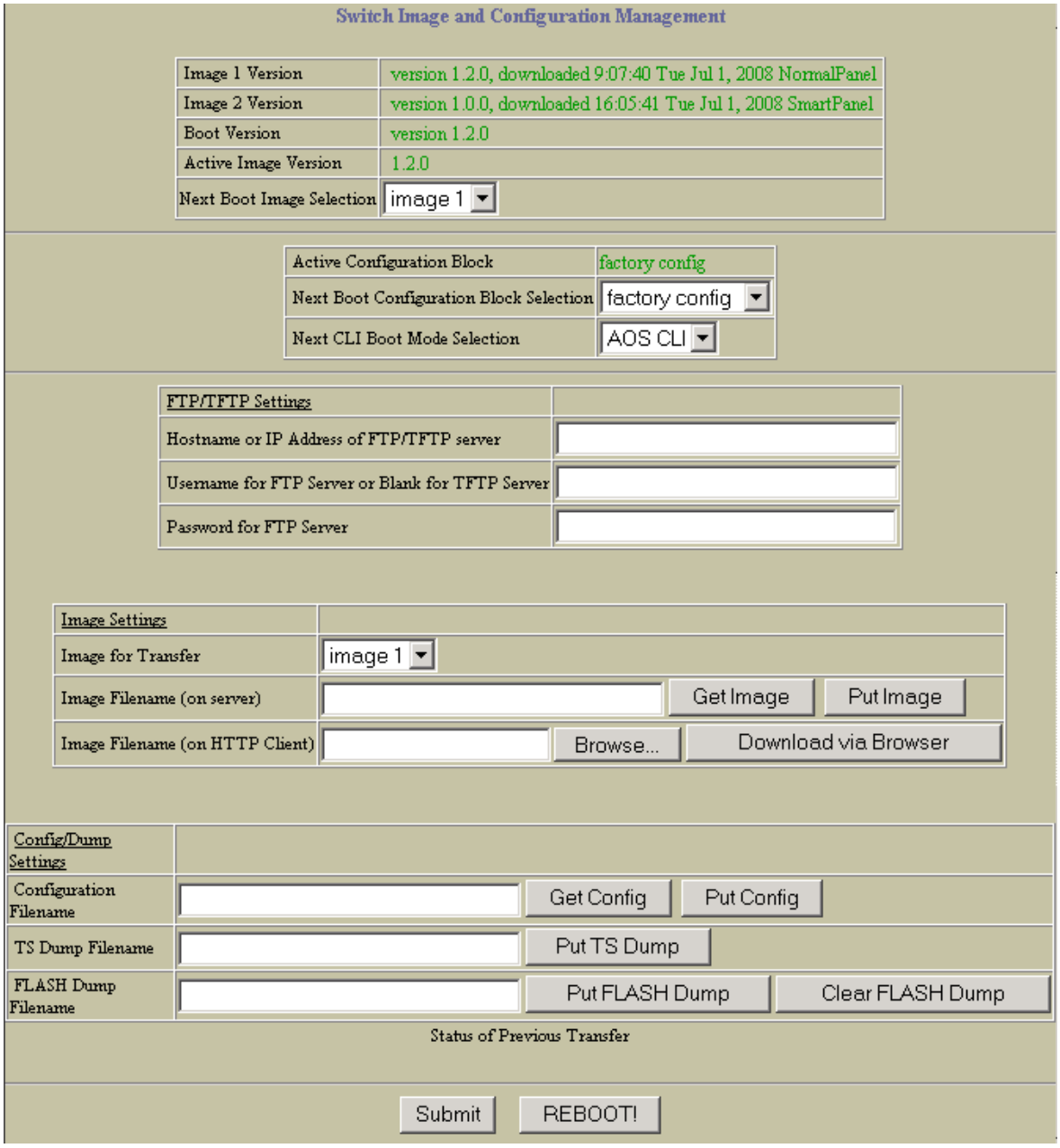
Control	Description
Enable/Disable Syslog and Trap of Console	Enables or disables syslog messages and traps of console-related events.
Enable/Disable Syslog and Trap of System	Enables or disables syslog messages and traps of system-related events.
Enable/Disable Syslog and Trap of Management	Enables or disables syslog messages and traps of management-related events.
Enable/Disable Syslog and Trap of CLI	Enables or disables syslog messages and traps of CLI-related events.
Enable/Disable Syslog and Trap of STP	Enables or disables syslog messages and traps of STP-related events.
Enable/Disable Syslog and Trap of VLAN	Enables or disables syslog messages and traps of VLAN-related events.
Enable/Disable Syslog and Trap of WEB	Enables or disables syslog messages and traps of Web-related events.
Enable/Disable Syslog and Trap of IP	Enables or disables syslog messages and traps of IP-related events.
Enable/Disable Syslog and Trap of VRRP	Enables or disables syslog messages and traps of VRRP-related events.
Enable/Disable Syslog and Trap of SSH	Enables or disables syslog messages and traps of SSH-related events.
Enable/Disable Syslog and Trap of NTP	Enables or disables syslog messages and traps of NTP-related events.

Table 65 Syslog and Trap Feature Configuration controls

Control	Description
Enable/Disable Syslog and Trap of RMON	Enables or disables syslog messages and traps of Remote Monitoring (RMON) events.
Enable/Disable Syslog of UFD	Enables or disables syslog messages of Uplink Failure Detection (UFD) events.
Enable/Disable Syslog of CFG	Enables or disables syslog messages of configuration events.
Enable/Disable Trap of UFD	Enables or disables event traps of Uplink Failure Detection (UFD) events.

Switch Image and Configuration Management

To display the following form, select System > Config/Image Control.



The switch software image is the executable code running on the switch. A version of the image ships with the switch, and comes pre-installed on the device. As new versions of the image are released, you can upgrade the software running on your switch.

Upgrading the software image on your switch requires the following:

- Loading the new image onto a FTP/TFTP server on your network
- Downloading the new image from the FTP/TFTP server to your switch
- Selecting the new software image to be loaded into switch memory the next time the switch is reset

Downloading new software to your switch

The switch can store up to two different software images, called `image1` and `image2`, as well as boot software, called `boot`. When you download new software, you must specify where it should be placed: either into `image1`, `image2`, or `boot`.

By default, the software for the Layer2 switch mode (NormalPanel) is stored in the image1, and the software for the SmartPanel mode is stored in the image2.

To download new software to your switch, you will need the following:

- The image or boot software loaded on a FTP/TFTP server on your network
- The hostname or IP address of the FTP/TFTP server
- The name of the new software image or boot file

NOTE: For the information of SmartPanel, see the SmartPanel Reference Guide.

Configuration

When you make configuration changes to the switch, you must save the changes so that they are retained beyond the next time the switch is reset. When you perform the `save` command, you have two save options: save and save n. With save, your new configuration changes are placed in the active configuration block. The previous configuration is copied into the backup configuration block. If you select save n, your new configuration changes are placed in the active configuration block, and the backup configuration block remains unchanged.

There is also a factory configuration block. This holds the default configuration set by the factory when your switch was manufactured. Under certain circumstances, it may be desirable to reset the switch configuration to the default. This can be useful when a custom-configured switch is moved to a network environment where it will be re configured for a different purpose.

Switch Image and Configuration Management controls

The following table describes Switch Image and Configuration Management controls:

Table 66 Switch Image and Configuration Management controls

Control	Description
Image 1 Version	Displays information about the current Image 1 software. NormalPanel is shown that the software for the Layer2 switch mode is stored in the image.
Image 2 Version	Displays information about the current Image 2 software. SmartPanel is shown that the software for the SmartPanel mode is stored in the image.
Boot Version	Displays the version number of the current Boot software.
Active Image Version	Displays the version number of the active software image.
Next Boot Image Selection	Selects which software image (`image1` or `image2`) you want to run in switch memory for the next reboot.
Active Configuration Block	Displays the Configuration Block file that is currently running (active or backup).
Next Boot Configuration Block Selection	Selects the Configuration Block file (active or backup) that will run after the next reboot.
Next CLI Boot Mode Selection	Selects the type of command-line interface (CLI) used after the next reboot.
FTP/TFTP Settings	
Hostname or IP Address of FTP/TFTP server	Enter the host name or IP address of the TFPT server from which you will download software.

Table 66 Switch Image and Configuration Management controls

Control	Description
Username for FTP server of Blank for TFTP Server	Enter the user name, if you want to upload to the FTP server. Remain the blank, if you want to upload to the TFTP server.
Password for FTP server	Enter the password for the FTP server.
Image Settings	
Image for Transfer	Selects a software image to replace with the downloaded software.
Image Filename (on server)	Enter the name of the file on a FTP/TFTP server that contains the software image you want to download.
Image Filename (on HTTP Client)	Enter the name of the file on an HTTP Client that contains the software image you want to download.
Config/Dump Settings	
Configuration Filename	Selects the file name and location of the Configuration Block file to be downloaded.
TS Dump Filename	Selects the filename for the TS (tech support) dump that you want to upload to the FTP/TFTP server.
Flash Dump Filename	Selects the filename for the core (PANIC) dump that you want to upload to the FTP/TFTP server.
Status of Previous Transfer	Displays the status of the previous software download attempt.

Switch Image and Configuration Management buttons

The following table describes Switch Image and Configuration Management buttons:

Table 67 Switch Image and Configuration Management buttons

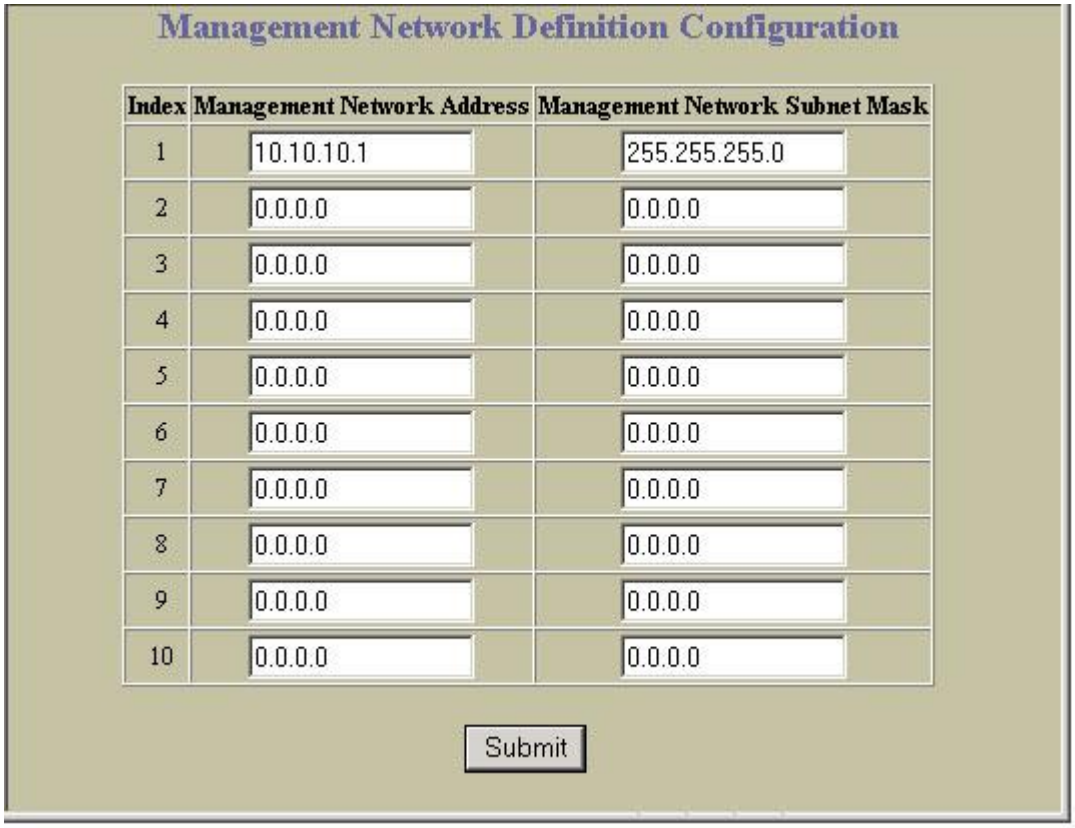
Button	Description
Get Image	Starts download of the software image file indicated in FTP/TFTP Image Filename field from the specified TFTP server.
Put Image	Starts upload of the software image file indicated in FTP/TFTP Image Filename field from the specified TFTP server.
Get Config	Downloads a previously saved switch Configuration Block file indicated in Configuration Filename from the specified the FTP/TFTP server. The active configuration will be replaced with the commands found in the downloaded configuration file. The file can contain a full switch configuration or a partial switch configuration. The new configuration is not activated until the apply command is used. If the apply command is found in the configuration script file loaded using this command, the apply action is performed automatically.
Put Config	Uploads the switch's active configuration to the script configuration file specified in Configuration Filename. The file is placed on the FTP/TFTP server.
Put TS Dump	Uploads the TS (tech support) dump file to the FTP/TFTP server specified in TS Dump Filename.
Put Dump	Uploads the core (PANIC) dump file to the FTP/TFTP server specified in Core Dump Filename.
Clear Flash Dump	Deletes the core dump in flash memory.
Submit	When selected, the form is sent to the switch. Any configuration changes are placed in the "pending" state and do not take effect until the toolbar Apply command is given.
REBOOT!	Reboots the switch.

NOTE: If the FTP/TFTP server is running SunOS or the Solaris operating system, the specified Put Config file must exist prior to executing the Put Config command and must be writable (set with proper permission, and not locked by any application). The contents of the specified file will be replaced with the current configuration data.

IMPORTANT: When the switch software is changed (NormalPanel or SmartPanel) and the switch is rebooted, the switch configuration is removed and the switch runs factory configuration block. Backup the switch configuration if needed.

Management Network Definition Configuration

To display the following form, select System > Mgmt.



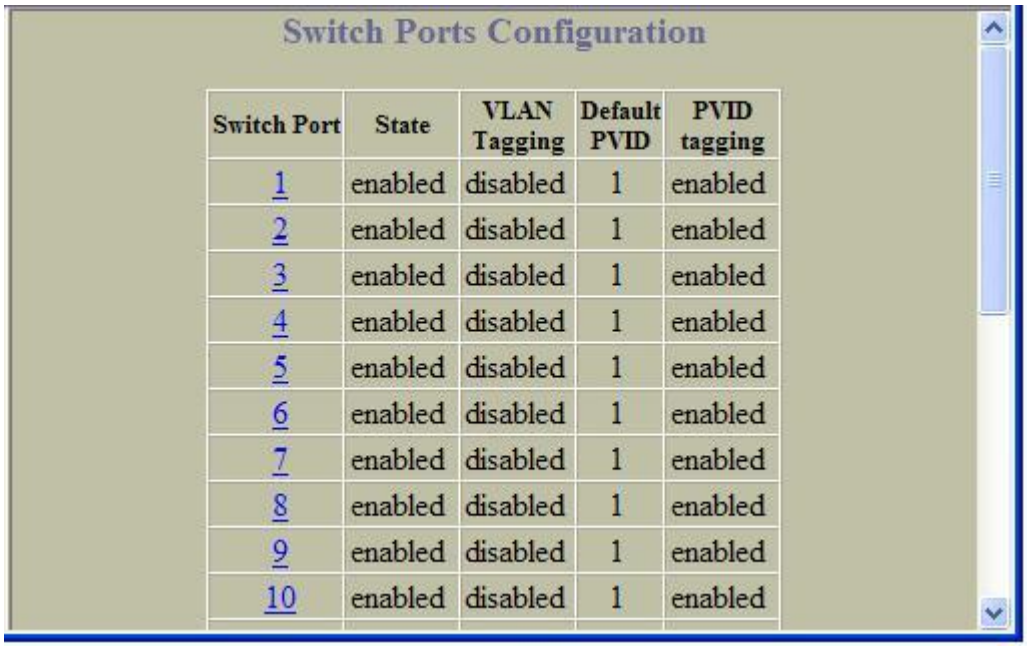
The following table describes the Management Network Definition Configuration controls:

Table 68 Management Network Definition Configuration controls

Control	Description
Index	Displays the index number that identifies each management network.
Management Network Address	Adds a defined network through which switch access is allowed through Telnet, SNMP, or the Browser-based Interface (BBI). A range of IP addresses is produced when used with a network mask address. Specify an IP address in dotted-decimal notation.
Management Network Subnet Mask	Specify a mask address in dotted-decimal notation.

Switch Ports Configuration

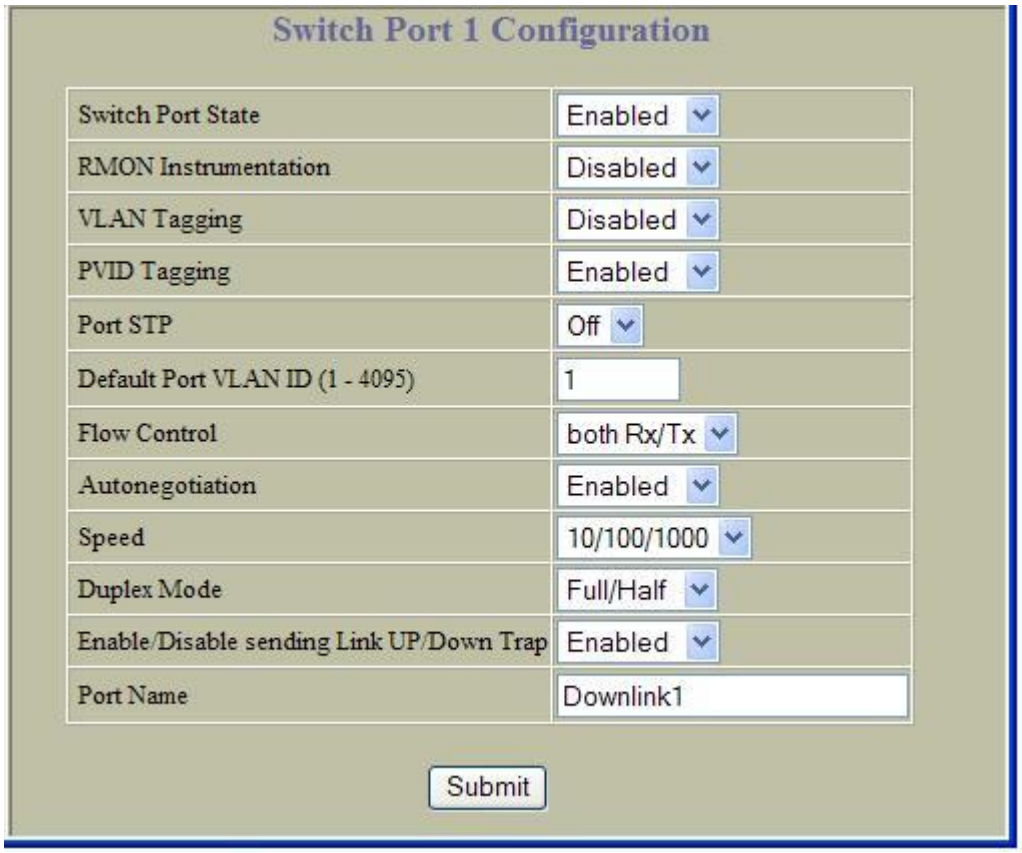
To display the following form, select System > Switch Ports (click the underlined text, not the folder).



This form summarizes the configuration of each port. Select a switch port number to go to its configuration form.

Switch Port Configuration

To display the following form, go to the Switch Ports Configuration form. Select a Switch Port number.



This form allows you to configure settings for individual switch ports.

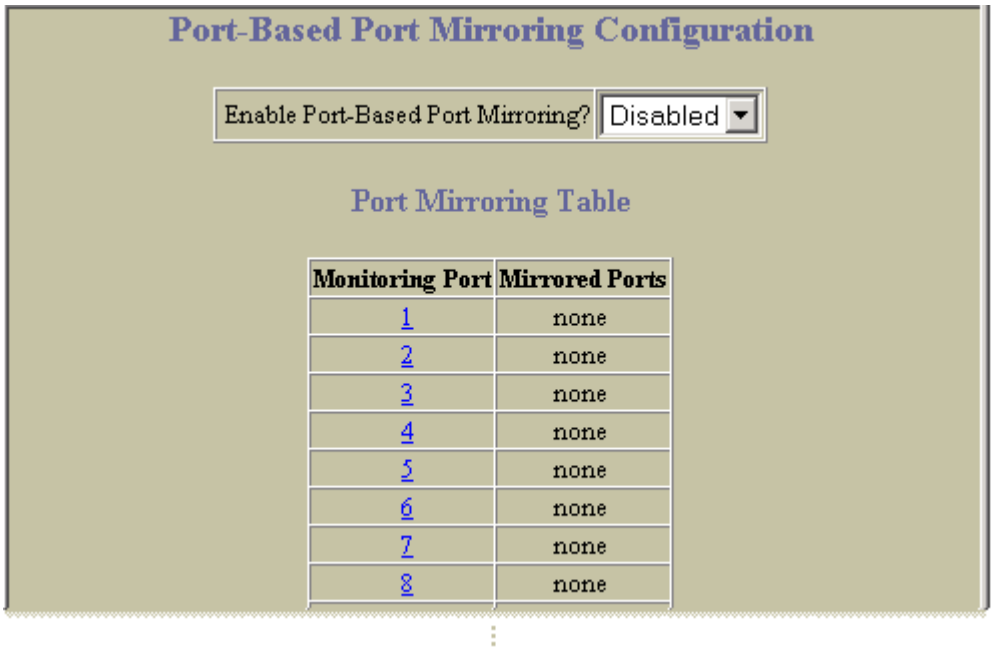
The following table describes the Switch Port Configuration controls:

Table 69 Switch Port Configuration controls

Control	Description
Switch Port State	Enables or disables the port.
RMON Instrumentation	Enables or disables Remote Monitoring for the port. RMON must be enabled for RMON statistics and history sampling to function.
VLAN Tagging	Disables or enables VLAN tagging for this port. It is disabled by default.
PVID Tagging	Disables or enables VLAN tag persistence. When disabled, the VLAN tag is removed from packets whose VLAN tag matches the port PVID. The default value is enabled.
Port STP	Turns Spanning Tree On or Off for this port.
Default Port VLAN ID (1-4095)	Sets the default VLAN number which will be used to forward frames which are not VLAN tagged. The default number is 1. Note: VLAN 4095 is reserved for switch management.
Flow Control	Sets the flow control. The choices include: • Receive flow control • Transmit flow control • Both receive and transmit flow control (default) • No flow control
Autonegotiation	Enables or disables auto negotiation for the port.
Speed	Sets the link speed. Not all options are valid on all ports. The choices include: • “Any,” for automatic detection (default) • 10 Mbps • 100 Mbps • 1000 Mbps
Duplex mode	Sets the operating mode. Not all options are valid on all ports. The choices include: • “Any,” for auto negotiation (default) • Full-duplex • Half-duplex
Enable/Disable sending Link UP/Down Trap	Enables or disables the sending of SNMP link up and link down traps. The default setting is enabled.
Port Name	Sets a name for the port. The assigned port name appears next to the port number on some information and statistics screens.

Port-Based Port Mirroring Configuration

To display the following form, select Port-Based Port Mirroring (click the underlined text, not the folder).



This form is used to configure, enable, and disable the Monitoring Port. When enabled, network packets being sent and/or received on a target port are duplicated and sent to a monitor port. By attaching a network analyzer to the monitor port, you can collect detailed information about your network performance and usage.

The following table describes the Port-Based Port Mirroring Configuration controls:

Table 70 Port Mirroring controls

Control	Description
Enable Port-Based Port Mirroring?	Enables or disables port mirroring on the switch. Port mirroring is disabled by default.
Monitoring Port	Selects a port number to configure the port as a monitoring port.
Mirrored Ports	Displays the port(s) currently mirrored for each monitoring port.

Monitoring Port Configuration

To display the following form, go to the Port-Based Port Mirroring Configuration form. Select a Monitoring Port number.

This form lists all mirrored ports for the selected port number. Click Add Mirrored Port to select a port to be monitored by this port. Click Delete Monitor Port to remove all mirrored ports from this port's monitoring configuration.

Port Mirroring Configuration for Port

To display the following form, go to the Monitoring Port *x* Configuration form. Select a Mirrored Port number, or click Add Mirrored Port.

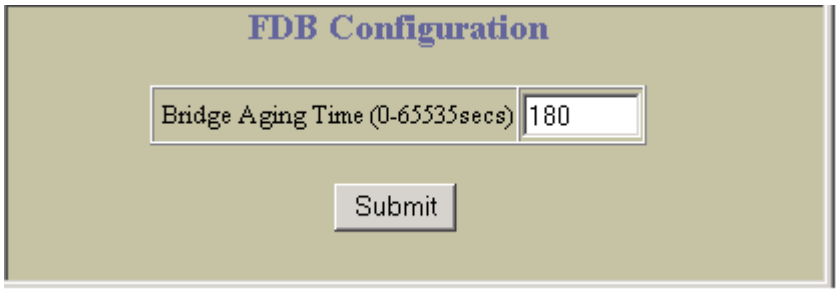
The following table describes the Port Mirroring Configuration for Port controls:

Table 71 Port Mirroring Configuration for Port controls

Control	Description
Mirrored Port	Adds the port to be mirrored.
Port Mirror Direction	Specifies the direction of the traffic, either in or out. It is necessary to specify the direction because: • If the source port of the frame matches the mirrored port and the mirrored direction is ingress or both (ingress and egress), the frame is sent to the mirrored port. • If the destination port of the frame matches the mirrored port and the mirrored direction is egress or both, the frame is sent to the monitoring port.

FDB Configuration

To display the following form, select Layer 2 > FDB (click the underlined text, not the folder).



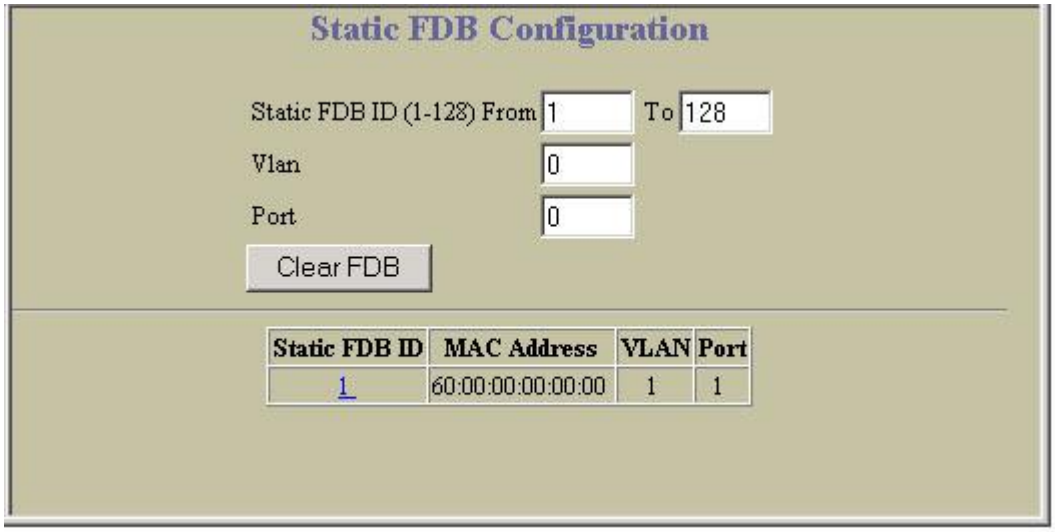
The following table describes the FDB Configuration controls:

Table 72 FDB Configuration controls

Control	Description
Bridge Aging Time (0-65535 secs)	Configures the forwarding database aging time. The aging time specifies the amount of time the STP bridge waits without receiving a packet from a station before removing the station from the forwarding database. The default is 180 seconds. To disable aging, set this parameter to 0.

Static FDB Configuration (part one)

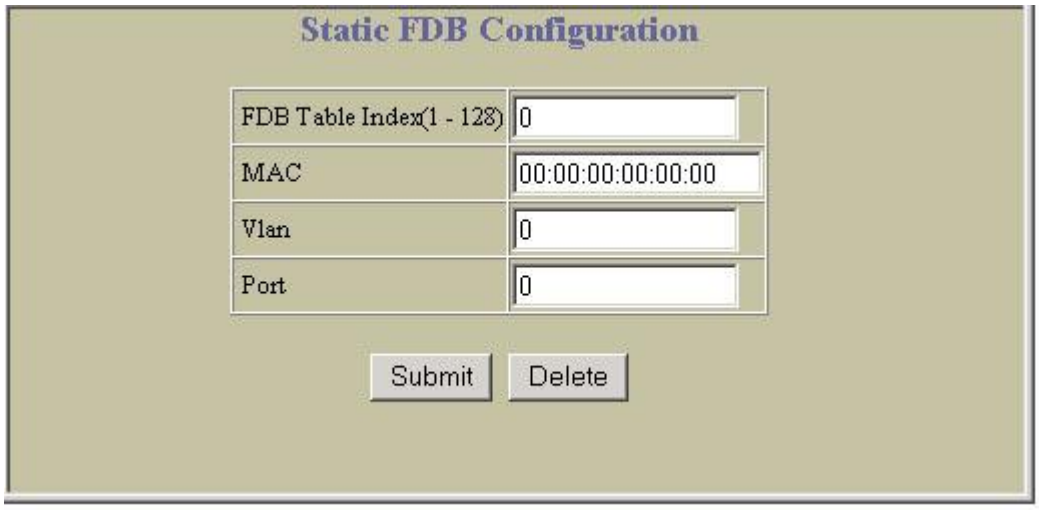
To display the following form, select Layer 2 > FDB >Static FDB (click the underlined text, not the folder).



This form summarizes the Static Forwarding Database entries. Select a static FDB ID number to display the Static FDB Configuration form. Click Clear to clear the static FDB entries.

Static FDB Configuration (part two)

To display the following form, select Layer 2 > FDB >Static FDB > Add static FDB entry.



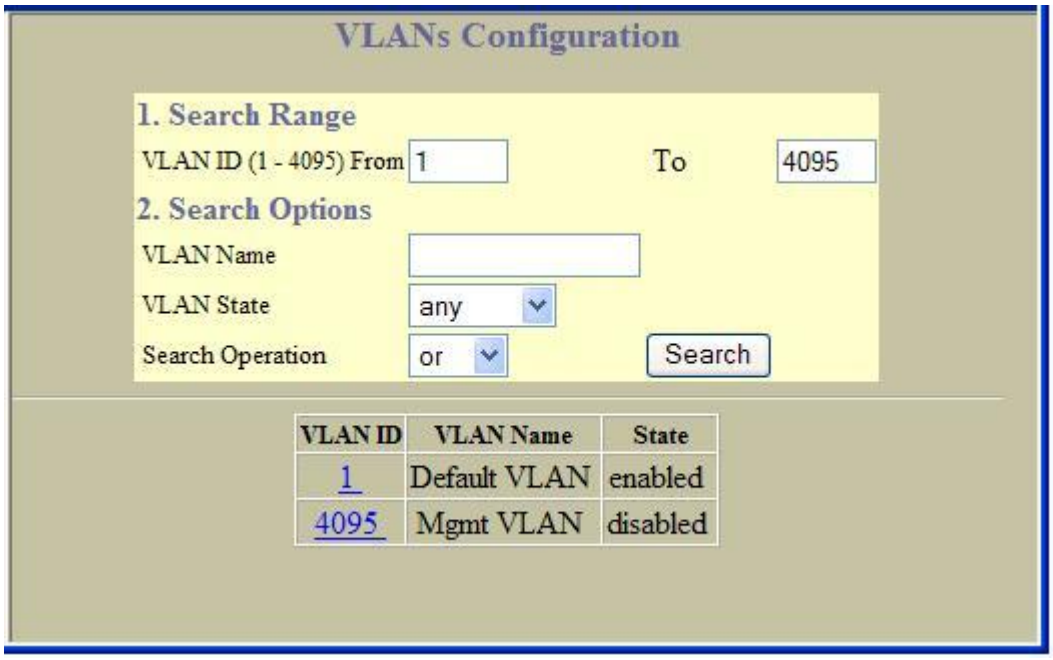
The following table describes the Static FDB Configuration controls:

Table 73 Static FDB Configuration controls

Control	Description
FDB Table Index (1-128)	Configures the index ID number of the static FDB entry.
MAC	Configures the MAC address of the static FDB entry.
Vlan	Configures the VLAN for the static FDB entry.
Port	Configures the port for the static FDB entry.

VLANs Configuration

To display the following form, select Layer 2 > Virtual LANs (click the underlined text, not the folder).



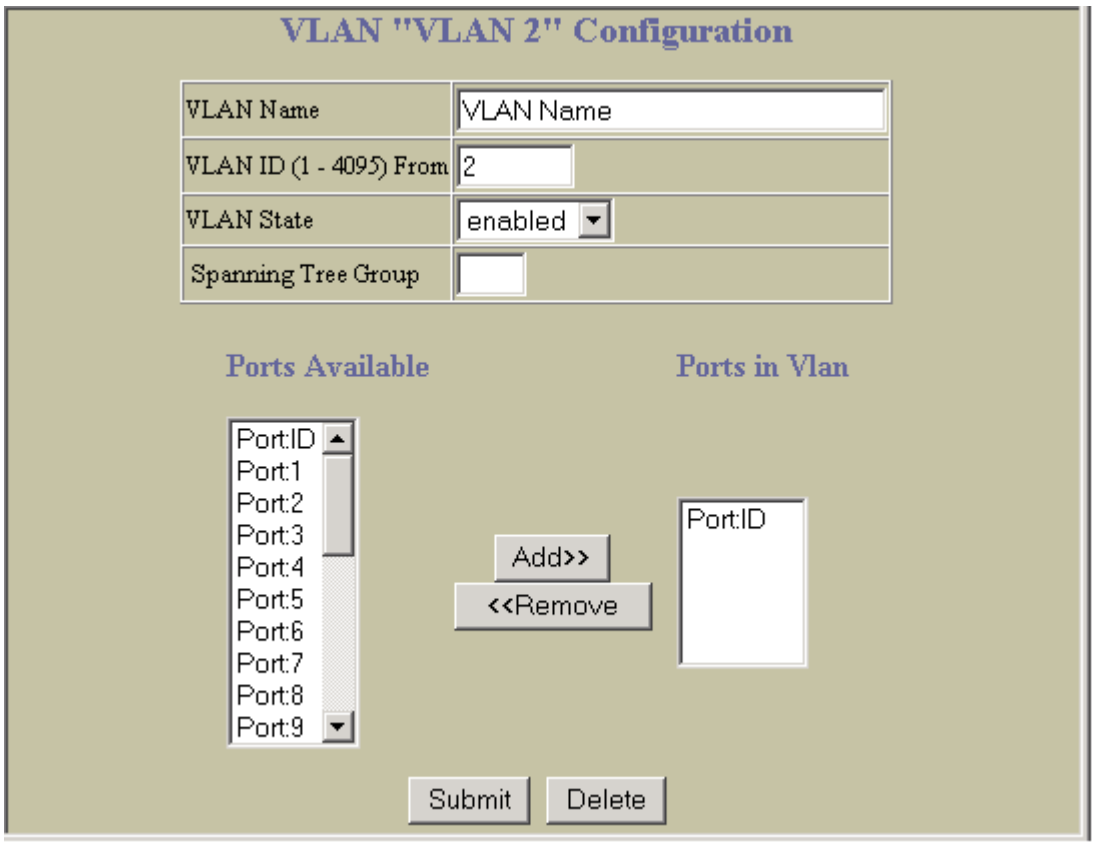
The following table describes the VLANs Configuration controls:

Table 74 VLANs Configuration controls

Control	Description
Search Range	To search for a VLAN, enter a range of VLAN numbers in the From and To fields.
Search Options	To focus the search for a VLAN, enter optional search parameters: • VLAN Name • VLAN State Fields that have a value of “any” are ignored during the search. Choose a search operation: • or: Search for VLANs specified in the search range that meet any of the criteria entered. • and: Search for VLANs specified in the search range that meet all of the criteria entered. Click Search to display VLANs that fit the range and meet the criteria entered.

VLAN Configuration

To display the following form, go to the VLANs Configuration form. Select a VLAN ID, or open the Virtual LANs folder and click Add VLAN.



The commands on this form configure VLAN attributes, change the status of the VLAN, delete the VLAN, and change the port membership of the VLAN.

By default, the VLAN menu option is disabled except VLAN 1, which is enabled all the time. This switch supports a maximum of 1,000 VLANs. VLAN 4095 is reserved for switch management.

The following table describes the VLAN Configuration controls:

Table 75 VLAN Configuration controls

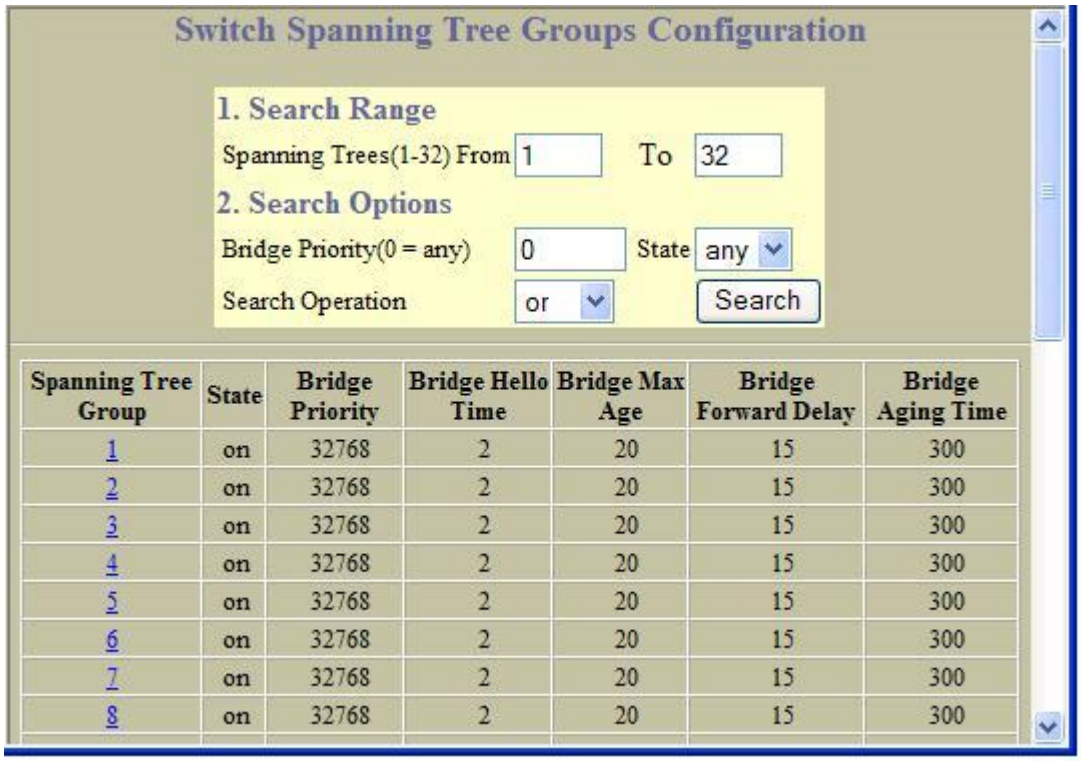
Control	Description
VLAN Name	Assigns a name to the VLAN or changes the existing name. The default VLAN name is the first one.
VLAN ID (1-4095)	Assigns a numeric identifier to the VLAN.
VLAN State	Enables or disables the VLAN.
Spanning Tree Group	Assigns a VLAN to a Spanning Tree Group.
Ports Available	Lists the ports that can be added to the VLAN.
Ports in Vlan	Lists the ports that are members of the VLAN. Select a port number in the Ports Available list and click Add to add the port to the VLAN membership. Select a port number in the Ports in VLAN list and click Remove to remove the port from the VLAN membership.

NOTE: Each port must belong to at least one VLAN. Any port which is removed from a VLAN and which is not a member of any other VLAN is automatically added to default VLAN #1. You cannot remove a port from VLAN #1 if the port has no membership in any other VLAN.

Also, you cannot add a port to more than one VLAN unless the port has VLAN tagging turned on.

Switch Spanning Tree Groups Configuration

To display the following form, select Layer 2 > Spanning Tree Groups (click the underlined text, not the folder).


Switch Spanning Tree Groups Configuration
1. Search Range
Spanning Trees(1-32) From 1 To 32
2. Search Options
Bridge Priority(0 = any) 0 State any
Search Operation or Search
Spanning Tree Group | State | Bridge Priority | Bridge Hello Time | Bridge Max Age | Bridge Forward Delay | Bridge Aging Time
1 on 32768 2 20 15 300
2 on 32768 2 20 15 300
3 on 32768 2 20 15 300
4 on 32768 2 20 15 300
5 on 32768 2 20 15 300
6 on 32768 2 20 15 300
7 on 32768 2 20 15 300
8 on 32768 2 20 15 300

This form summarizes Spanning Tree Group parameters.

This switch supports the IEEE 802.1d Spanning Tree Protocol (STP) and Per VLAN Spanning Tree (PVST+). You can configure up to 31 Spanning Tree Groups on the switch (STG 32 is reserved for switch management). Spanning Tree is turned on by default.

NOTE: When RSTP is turned on, only STP group 1 can be configured.

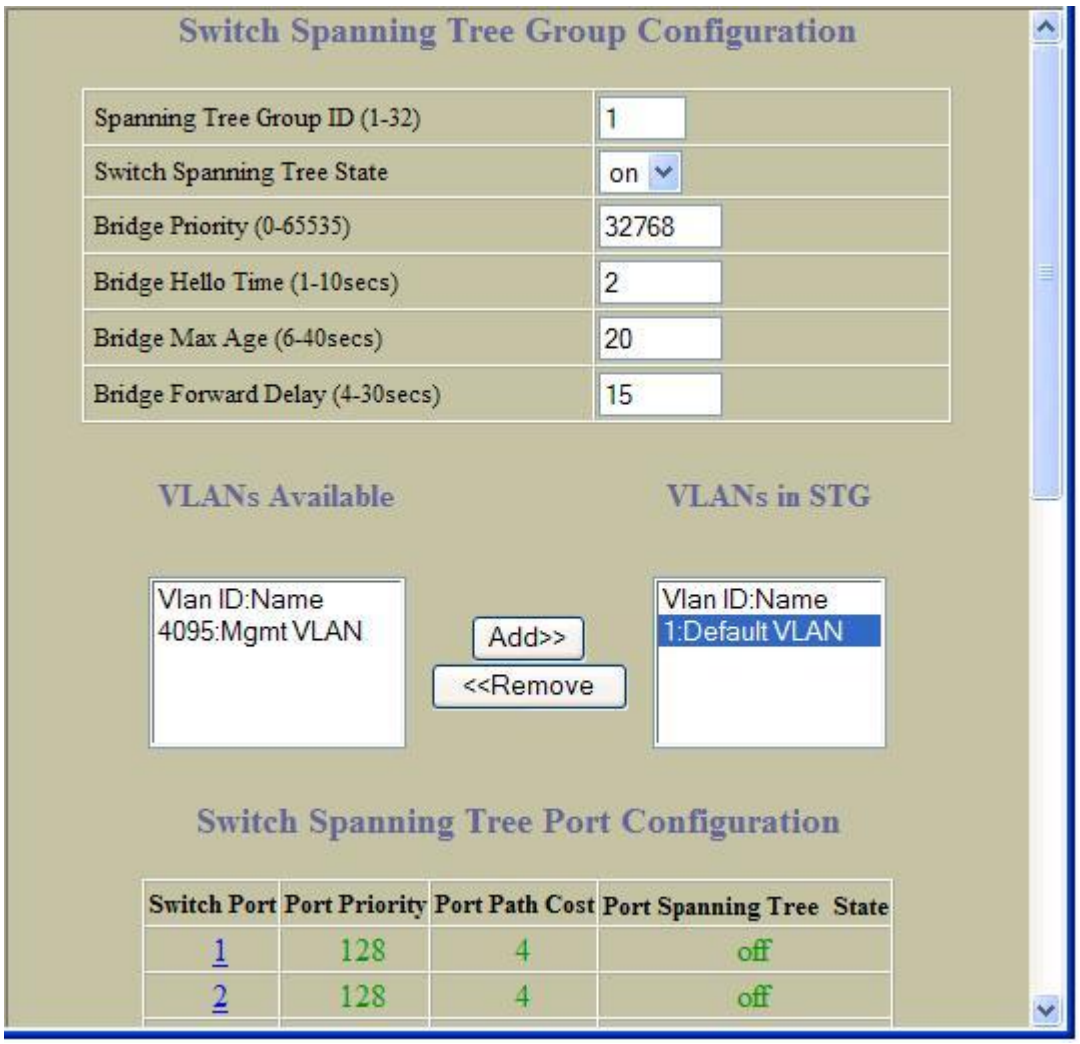
The following table describes the Switch Spanning Tree Groups Configuration controls:

Table 76 Switch Spanning Tree Groups Configuration controls

Control	Description
Search Range	To search for a Spanning Tree Group, enter a range of group numbers in the From and To fields.
Search Options	To focus the search for a Spanning Tree Group, enter optional search parameters: • Bridge Priority • Spanning Tree State Fields that have a value of “any” are ignored during the search. Choose a search operation: • or: Search for Spanning Tree Groups specified in the search range that meet any of the criteria entered. • and: Search for Spanning Tree Groups specified in the search range that meet all of the criteria entered. Click Search to display Spanning Tree Groups that fit the range and meet the criteria entered.

Switch Spanning Tree Group Configuration

To display the following form, go to the Switch Spanning Tree Groups Configuration form. Select a Spanning Tree Group number, or open the Spanning Tree Groups folder and click Add Spanning Tree Group.



Spanning Tree bridge parameters can be configured for each Spanning Tree Group.

The following table describes the Spanning Tree Group Configuration controls:

Table 77 Switch Spanning Tree Group Configuration controls

Control	Description
Spanning Tree Group ID (1-31)	Selects a Spanning Tree Group to configure. Note: Spanning Tree Group 32 is reserved for switch management.
Switch Spanning Tree State	Turns Spanning Tree on or off for the selected STP group.
Bridge Priority (0-65535)	Configures the bridge priority. The bridge priority parameter controls which bridge on the network is the STP root bridge. To make this switch the root bridge, configure the bridge priority lower than all other switches and bridges on your network. The lower the value, the higher the bridge priority. The range is 0 to 65535, and the default is 32768. RSTP/MSTP: The range is 0 to 61440, in steps of 4096 (0, 4096, 8192...), and the default is 32768. This command does not apply to MSTP. See the “Common Internal Spanning Tree Bridge Configuration” section for more information.
Bridge Hello Time (1-10 secs)	Configures the bridge hello time. The hello time specifies how often the root bridge transmits a configuration bridge protocol data unit (BPDU). Any bridge that is not the root bridge uses the root bridge hello value. The range is 1 to 10 seconds, and the default is 2 seconds. This command does not apply to MSTP. (See the “Common Internal Spanning Tree Bridge Configuration” section.)
Bridge Max Age (6-40 secs)	Configures the bridge maximum age. The maximum age parameter specifies the maximum time the bridge waits without receiving a configuration bridge protocol data unit before it reconfigures the STP network. The range is 6 to 40 seconds, and the default is 20 seconds. This command does not apply to MSTP. See the “Common Internal Spanning Tree Bridge Configuration” section for more information.
Bridge Forward Delay (4-30 secs)	Configures the bridge forward delay parameter. The forward delay parameter specifies the amount of time that a bridge port has to wait before it changes from the listening state to the learning state and from the learning state to the forwarding state. The range is 4 to 30 seconds, and the default is 15 seconds. This command does not apply to MSTP. See the “Common Internal Spanning Tree Bridge Configuration” section for more information.
VLANs Available	Lists the VLANs that can be added to the Spanning Tree Group.
VLANs in STG	Lists the VLANs that are members of the Spanning Tree Group. Select a VLAN number in the VLANs Available list and click Add to add the VLAN to the Spanning Tree Group. Select a VLAN number in the VLANs in STG list and click Remove to remove the VLAN from the Spanning Tree Group.
Switch Spanning Tree Port Configuration Switch Port	Select a port number to display the switch spanning tree port configuration.

When configuring STP bridge parameters, the following formulas must be used:

- 2*(fwd-1) > mxage
- 2*(hello+1) < mxage

Switch Spanning Tree Group Port Configuration

To display the following form, go to the Switch Spanning Tree Group Configuration form. Select a Switch Port number.

Spanning Tree port parameters are used to modify STP operation on an individual port basis.

By default for STP/PVST+, Spanning Tree is turned Off for downlink ports (1-16), and turned On for uplink and cross-connect ports (17-18, 20-24). By default for RSTP/MSTP, Spanning Tree is turned On for all ports, with downlink ports configured as Edge ports.

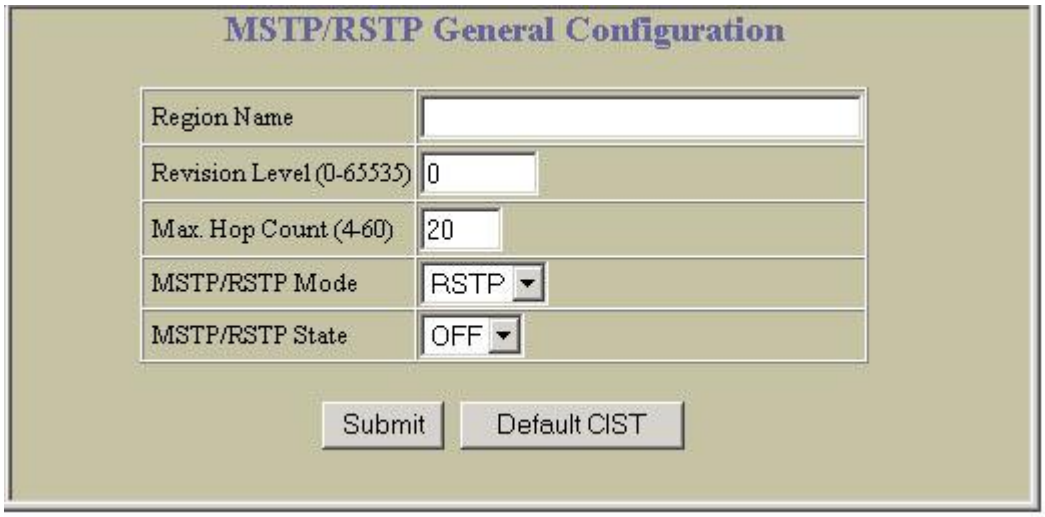
The following table describes the Switch Spanning Tree Group Port Configuration controls:

Table 78 Switch Spanning Tree Group Port Configuration controls

Control	Description
Port Priority	Configures the port priority. The port priority helps determine which bridge port becomes the designated port. In a network topology that has multiple bridge ports connected to a single segment, the port with the lowest port priority becomes the designated port for the segment. The range is 0 to 255, and the default is 128. RSTP/MSTP: The range is 0 to 240, in steps of 16 (0, 16, 32...) and the default is 128.
Port Path Cost	Configures the port path cost. The port path cost is used to help determine the designated port for a segment. Generally speaking, the faster the port, the lower the path cost. The range is 1 to 65535. The default is 10 for 100Mbps ports, and 1 for Gigabit ports. A value of 0 indicates that the default cost will be computed for an auto-negotiated link speed. RSTP/MSTP: The range is 1 – 200000000, and the default it 20000 for Gigabit ports.
Link Type	Defines the type of link connected to the port, as follows: • auto: Configures the port to detect the link type, and automatically match its settings. • p2p: Configures the port for Point-To-Point protocol. • shared: Configures the port to connect to a shared medium (usually a hub). This command only applies when RSTP is turned on.
Edge Port	Enables or disables this port as an edge port. An edge port is not connected to a bridge, and can begin forwarding traffic as soon as the link is up. Configure server ports as edge ports (enabled). This command only applies when RSTP is turned on.
Port Fast Forwarding mode	Enables or disables Port Fast Forwarding on the port.
Port Spanning Tree State	Enables or disables STP on the port.

MSTP/RSTP General Configuration

To display the following form, select Layer 2 > MSTP/RSTP > General.



The switch supports the IEEE 802.1w Rapid Spanning Tree Protocol (RSTP) and IEEE 802.1s Multiple Spanning Tree Protocol (MSTP). MSTP allows you to map many VLANs to a small number of spanning tree groups, each with its own topology.

You can configure up to 31 spanning tree groups on this switch. MSTP/RSTP is turned off by default.

The following table describes the MSTP/RSTP General Configuration controls:

Table 79 MSTP/RSTP General Configuration controls

Control	Description
Region Name	Configures a name for the MSTP region. All devices within a MSTP region must have the same region name. The Region Name can have a maximum of 15 characters.
Revision Level (0-65535)	Configures a version number for the MSTP region. The version is used as a numerical identifier for the region. All devices within a MSTP region must have the same version number.
Max. Hop Count (4-60)	Configures the maximum number of bridge hops a packet may to traverse before it is dropped. The range is from 4 to 60 hops. The default is 20.
MSTP/RSTP Mode	Selects either Rapid Spanning Tree Protocol (RSTP) or Multiple Spanning Tree Protocol (MSTP). The default mode is RSTP.
MSTP/RSTP State	Globally turns RSTP/MSTP on or off. Note: When RSTP is turned on, the configuration parameters for STP group 1 apply to RSTP.
Default CIST	This button resets CIST general parameters to their default values.

NOTE:

- IEEE 802.1w standard-based RSTP implementation runs on one STG (i.e. same as one spanning tree instance) only. As a result, if 'RSTP' is selected as the MSTP/RSTP mode, then only a single RSTP instance (default for STG 1) is supported for all VLANs, including the Default VLAN 1.
- If multiple spanning tree instances are required, then select 'MSTP' mode, so that multiple VLANs are handled by multiple spanning tree instances, as specified by IEEE 802.1s standard-based MSTP implementation.
- Only IEEE 802.1s MSTP supports rapid convergence using IEEE 802.1w RSTP.
- PVST+ does not support rapid convergence in current versions.

NOTE:

The following configurations are unsupported:

1 PVST+ (default Spanning Tree setting) is NOT interoperable with Cisco Rapid PVST+.

2 MSTP/RSTP (with mode set to either 'mstp' or 'rstp') is NOT interoperable with Cisco Rapid PVST+.

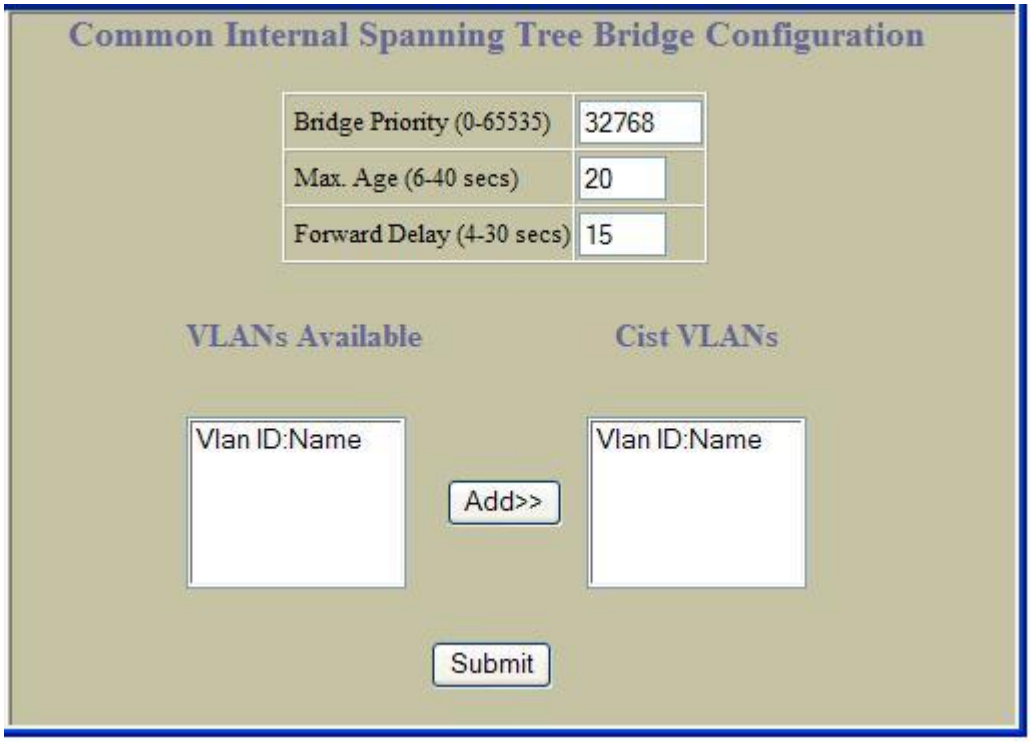
The following configurations are supported:

1 PVST+ (default Spanning Tree setting) is interoperable with Cisco PVST+.

2 MSTP/RSTP (with mode set to 'mstp') is interoperable with Cisco MST/RSTP.

Common Internal Spanning Tree Bridge Configuration

To display the following form, select Layer 2 > MSTP/RSTP > CIST-Bridge.



The CIST provides compatibility with different MSTP regions and with devices running different Spanning Tree instances. It is equivalent to Spanning Tree Group 0.

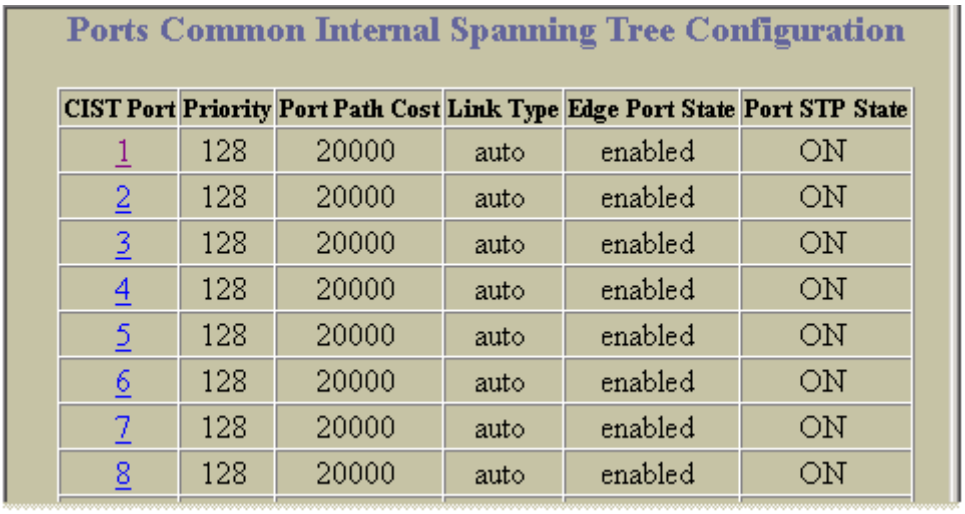
The following table describes the Common Internal Spanning Tree Bridge Configuration controls:

Table 80 Common Internal Spanning Tree Bridge Configuration controls

Control	Description
Bridge Priority (0-65535)	Configures the CIST bridge priority. The bridge priority parameter controls which bridge on the network is the MSTP root bridge. To make this switch the root bridge, configure the bridge priority lower than all other switches and bridges on your network. The lower the value, the higher the bridge priority. The range is 0 to 65535, and the default is 32768. This command does not apply to RSTP. See the "Switch Spanning Tree Group Configuration" section for more information.
Max. Age (6-40 secs)	Configures the CIST bridge maximum age. The maximum age parameter specifies the maximum time the bridge waits without receiving a configuration bridge protocol data unit before it reconfigures the MSTP network. The range is 6 to 40 seconds, and the default is 20 seconds. This command does not apply to RSTP. See the "Switch Spanning Tree Group Configuration" section for more information.
Forward Delay (4-30 secs)	Configures the CIST bridge forward delay parameter. The forward delay parameter specifies the amount of time that a bridge port has to wait before it changes from the listening state to the learning state and from the learning state to the forwarding state. The range is 4 to 30 seconds, and the default is 15 seconds. This command does not apply to RSTP. See the "Switch Spanning Tree Group Configuration" section for more information.
VLANs Available	Lists the VLANs that can be added to the Common Internal Spanning Tree (CIST).
Cist VLANs	Lists the VLANs that are members of the Common Internal Spanning Tree (CIST). Select a VLAN number in the VLANs Available list and click Add to add the VLAN to the CIST. Select a VLAN number in the Cist VLANs list and click Remove to remove the VLAN from the CIST.

Ports Common Internal Spanning Tree Configuration

To display the following form, select Layer 2 > MSTP/RSTP > CIST-Ports.

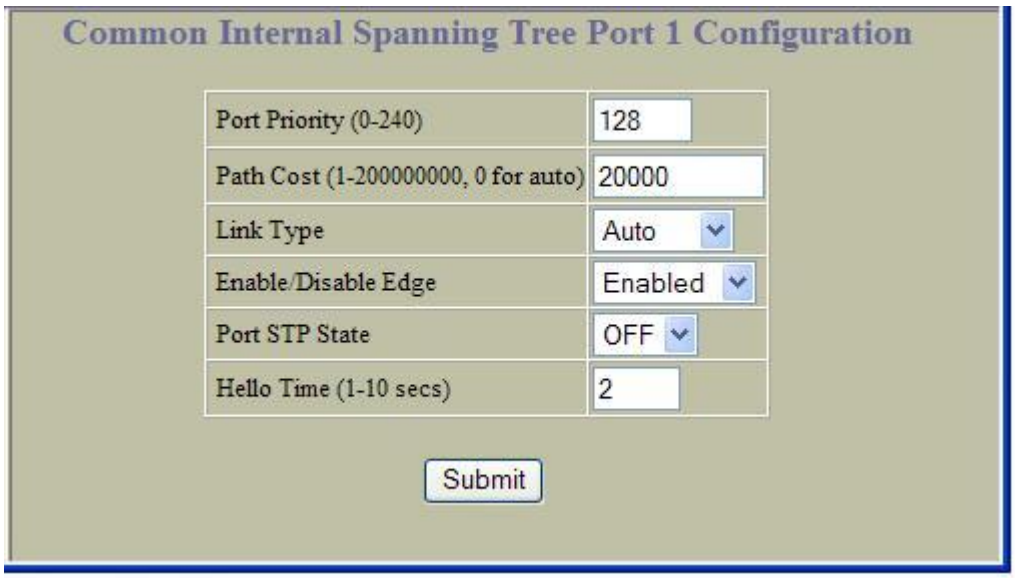


Ports Common Internal Spanning Tree Configuration

CIST Port	Priority	Port Path Cost	Link Type	Edge Port State	Port STP State
1	128	20000	auto	enabled	ON
2	128	20000	auto	enabled	ON
3	128	20000	auto	enabled	ON
4	128	20000	auto	enabled	ON
5	128	20000	auto	enabled	ON
6	128	20000	auto	enabled	ON
7	128	20000	auto	enabled	ON
8	128	20000	auto	enabled	ON

Common Internal Spanning Tree Port Configuration

To display the following form, go to the Ports Common Internal Spanning Tree Configuration form. Select a CIST Port number.



This form summarizes the port CIST parameters. Common Internal Spanning Tree port parameters are used to modify MSTP operation on an individual port basis. For each port, MSTP is turned on by default.

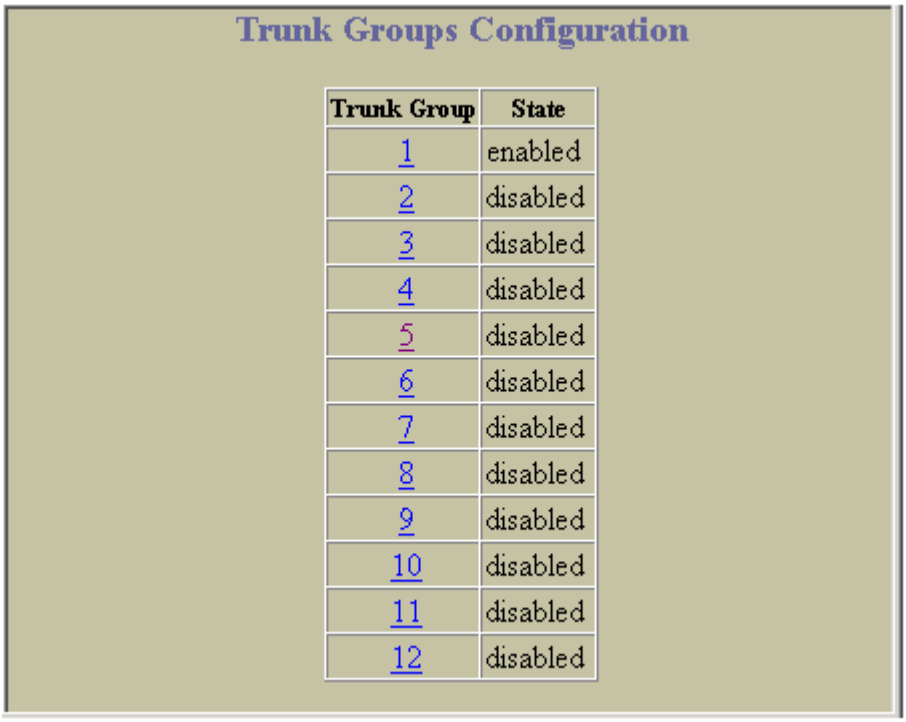
The following table describes the Common Internal Spanning Tree Port Configuration controls:

Table 81 Common Internal Spanning Tree Port Configuration controls

Control	Description
Port Priority (0-240)	Configures the CIST port priority. The port priority helps determine which bridge port becomes the designated port. In a network topology that has multiple bridge ports connected to a single segment, the port with the lowest port priority becomes the designated port for the segment. The range is 0 to 240, in steps of 16 (0, 16, 32...) and the default is 128.
Path Cost (1-200000000)	Configures the CIST port path cost. The port path cost is used to help determine the designated port for a segment. Generally speaking, the faster the port, the lower the path cost. The default is 20000 for Gigabit ports.
Link Type	Defines the type of link connected to the port, as follows: • auto: Configures the port to detect the link type, and automatically match its settings. • p2p: Configures the port for Point-To-Point protocol. • shared: Configures the port to connect to a shared medium (usually a hub). The default link type is auto.
Enable/Disable Edge	Enables or disables this port as an edge port. An edge port is not connected to a bridge, and can begin forwarding traffic as soon as the link is up. Configure server ports as edge ports (enabled). This command is disabled by default.
Port STP State	Turns MSTP on or off for this port.
Hello Time (1-10 secs)	Configures how often “keep alive” BPDU messages are transmitted.

Trunk Groups Configuration

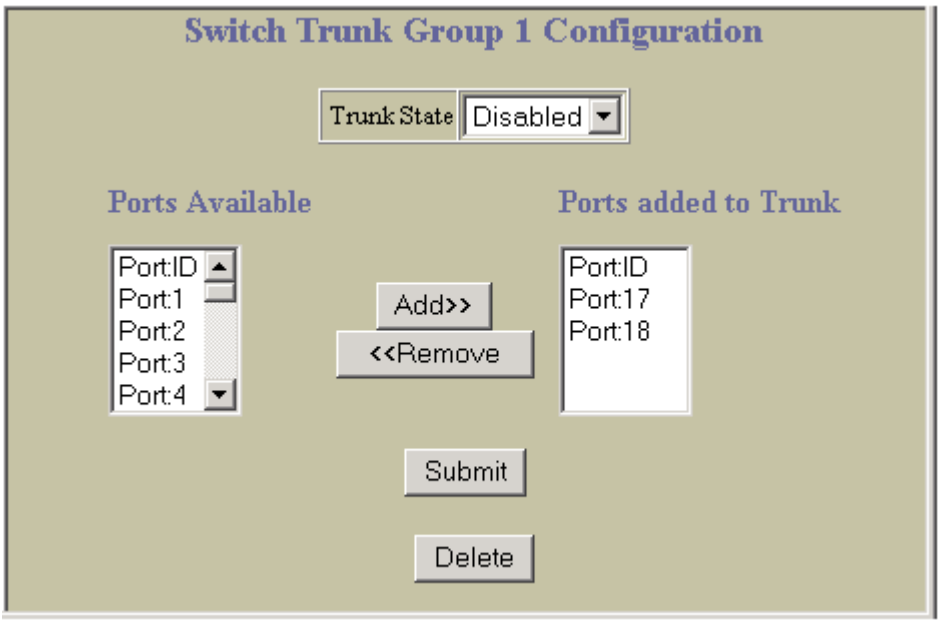
To display the following form, select Layer 2 > Trunk Groups.



This form provides a summary of the state of all trunk groups.

Switch Trunk Group Configuration

To display the following form, go to the Trunk Groups Configuration form. Select a Trunk Group number.



This form enables you to configure a selected switch trunk group.

Trunk groups can provide super-bandwidth connections between switches or other trunk capable devices. A trunk is a group of ports that act together, combining their bandwidth to create a single, larger port. Up to 12 trunk groups can be configured on the switch with the following restrictions:

- Any physical switch port can belong to no more than one trunk group.
- Up to six ports/trunks can belong to the same trunk group.
- All ports in a trunk must have the same configuration for speed, flow control, and autonegotiation.
- Trunking from other devices must comply with Cisco® EtherChannel® technology.
- By default, port 17 and 18 are trunked. By default, ports 17 and 18 are disabled.

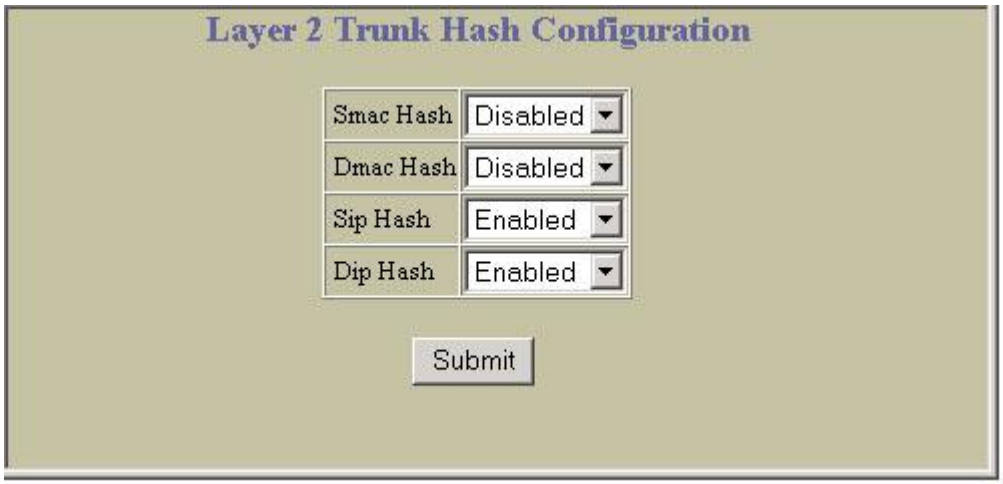
The following table describes the Switch Trunk Group Configuration controls:

Table 82 Switch Trunk Group Configuration controls

Control	Description
Trunk State	Enables or disables the Trunk Group.
Ports Available	Lists the ports that you can add to the Trunk Group.
Ports added to Trunk	Lists the ports that are members of the Trunk Group. Select a port number in the Ports Available list, and click Add to add the port to the Trunk Group. Select a port number in the Ports added to Trunk list and click Remove to remove the port from the Trunk Group.

Trunk Hash Configuration

To display the following form, select Layer 2 > Trunk Hash.



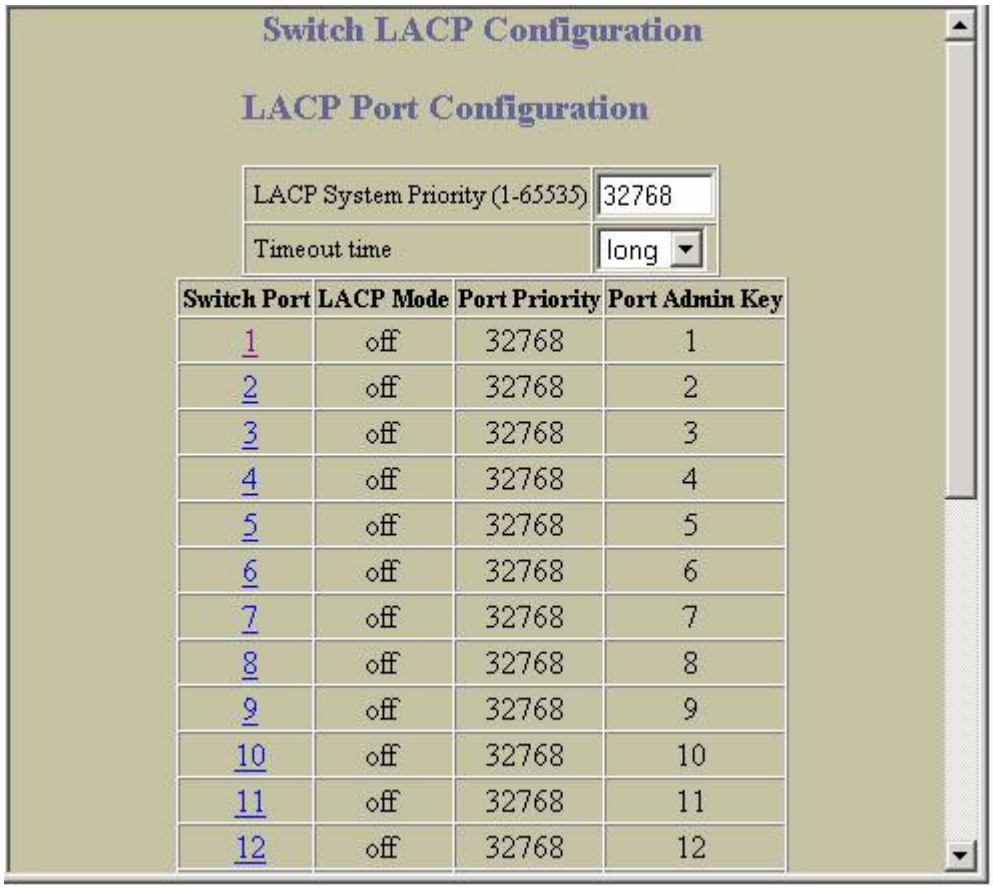
The following table describes the Layer 2 Trunk Hash Configuration controls:

Table 83 Layer 2 Trunk Hash Configuration controls

Control	Description
Smac	Enable or disable trunk hashing on the source MAC.
Dmac	Enable or disable trunk hashing on the destination MAC.
Sip	Enable or disable trunk hashing on the source IP.
Dip	Enable or disable trunk hashing on the destination IP.

LACP Configuration

To display the following form, select Layer 2 > LACP.


Switch LACP Configuration
LACP Port Configuration
LACP System Priority (1-65535) 32768
Timeout time long
Switch Port LACP Mode Port Priority Port Admin Key
1 off 32768 1
2 off 32768 2
3 off 32768 3
4 off 32768 4
5 off 32768 5
6 off 32768 6
7 off 32768 7
8 off 32768 8
9 off 32768 9
10 off 32768 10
11 off 32768 11
12 off 32768 12

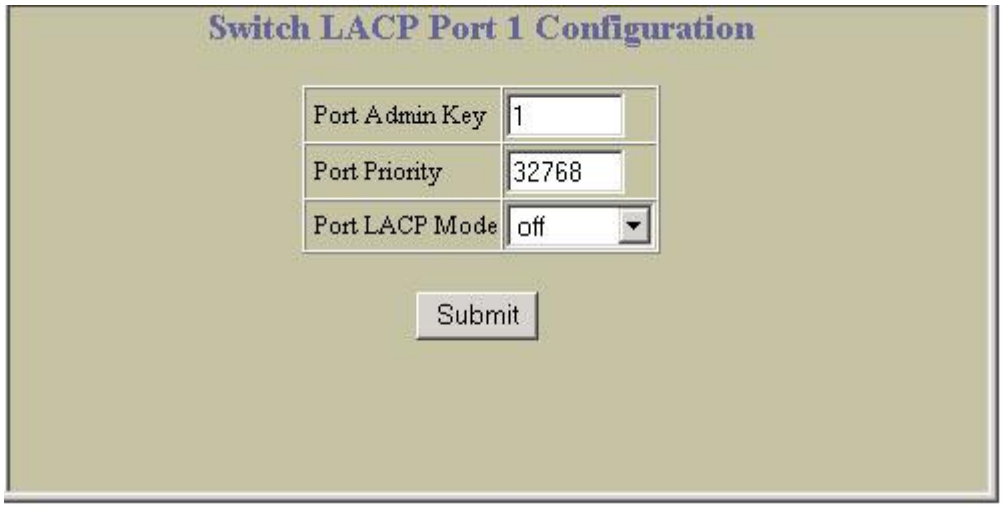
The following table describes the Switch LACP Configuration controls:

Table 84 Switch LACP Configuration controls

Control	Description
LACP System Priority (1-65535)	Defines the priority value (1 through 65535) for the switch. Lower numbers provide higher priority. The default value is 32768.
Timeout time	Defines the timeout period before invalidating LACP data from a remote partner. Choose **short** (3 seconds) or **long** (90 seconds). The default value is **long**. **Note**: It is recommended that you use a timeout value of **long**, to reduce LACPDU processing. If your switch's CPU utilization rate remains at 100% for periods of 90 seconds or more, consider using static trunks instead of LACP.

LACP Port Configuration

To display the following form, go to the Switch LACP Configuration form. Select a port number.



The following table describes the LACP Port Configuration controls:

Table 85 LACP Port Configuration controls

Control	Description
Port Admin Key	Set the admin key for this port. Only ports with the same admin key and oper key (operational state generated internally) can form a LACP trunk group.
Port Priority	Sets the priority value for the selected port. Lower numbers provide higher priority. Default is 128.
Port LACP Mode	Set the LACP mode for this port, as follows: • **off**: Turn LACP off for this port. You can use this port to manually configure a static trunk. The default value is **`off`**. • **active:** Turn LACP on and set this port to active. Active ports initiate LACPDUs. • **passive:** Turn LACP on and set this port to passive. Passive ports do not initiate LACPDUs, but respond to LACPDUs from active ports.

Uplink Fast General Configuration

To display the following form, select Layer 2 > UpLink Fast.

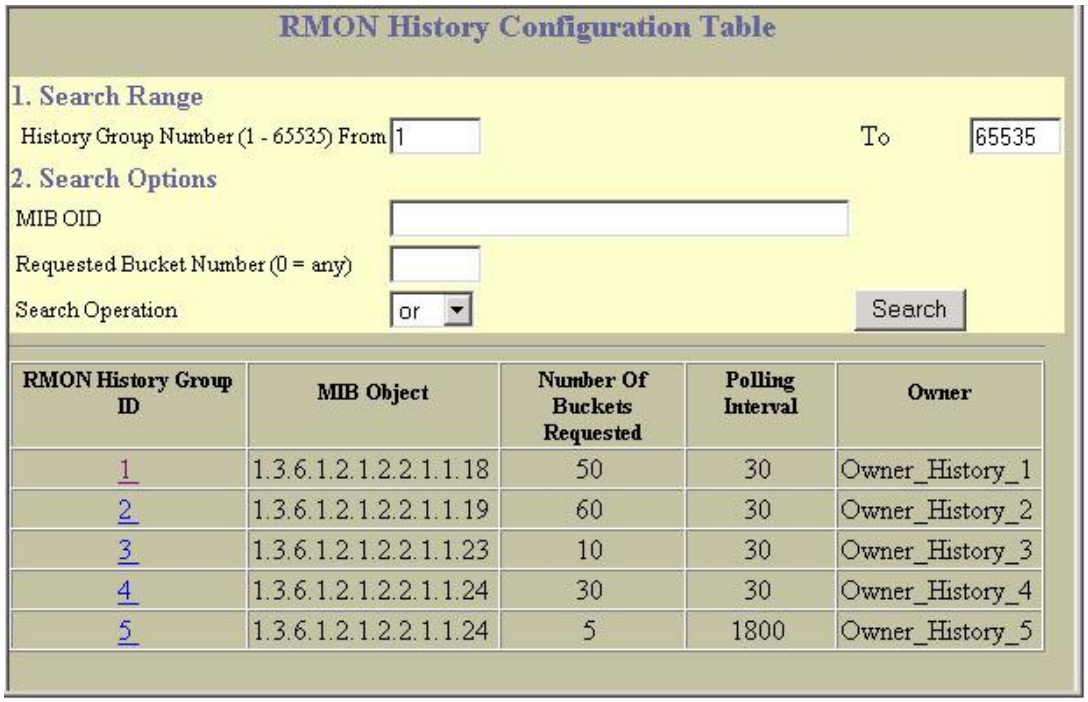
The following table describes the Uplink Fast Configuration controls:

Table 86 Uplink Fast Configuration controls

Control	Description
Enabled?	Enables or disables Fast Uplink Convergence, which provides rapid Spanning Tree convergence to an upstream switch during failover. Note: When enabled, this feature increases bridge priorities to 65500 for all STGs and path cost by 3000 for all external STP ports.
Update Rate (10-200)	Configures the station update rate. The default value is 40.

RMON History Configuration Table

To display the following form, select RMON > History (click the underlined text, not the folder).



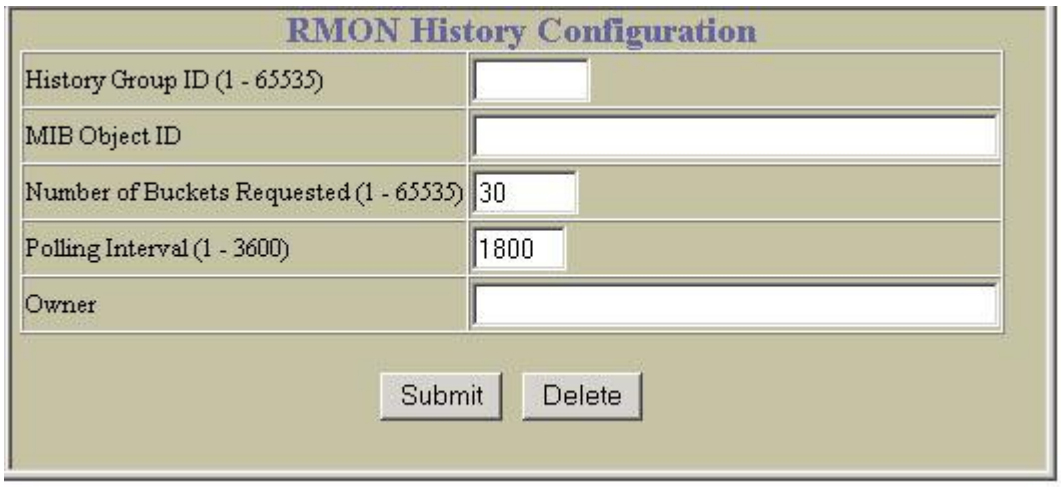
The following table describes the RMON History Groups Configuration controls:

Table 87 RMON History Configuration controls

Control	Description
Search Range	To search for a History Group, enter a range of numbers in the From and To fields.
Search Options	To focus the search for a History Group, enter optional search parameters: • MIB OID • Requested Number of Buckets Fields that have a value of “any” are ignored during the search. Choose a search operation: • or: Search for History Groups specified in the search range that meet any of the criteria entered. • and: Search for History Groups specified in the search range that meet all of the criteria entered. Click Search to display History Groups that fit the range and meet the criteria entered.

RMON History Configuration

To display the following form, go to the RMON History Groups Configuration form. Select a History Group, or open the History folder and click Add History Group.



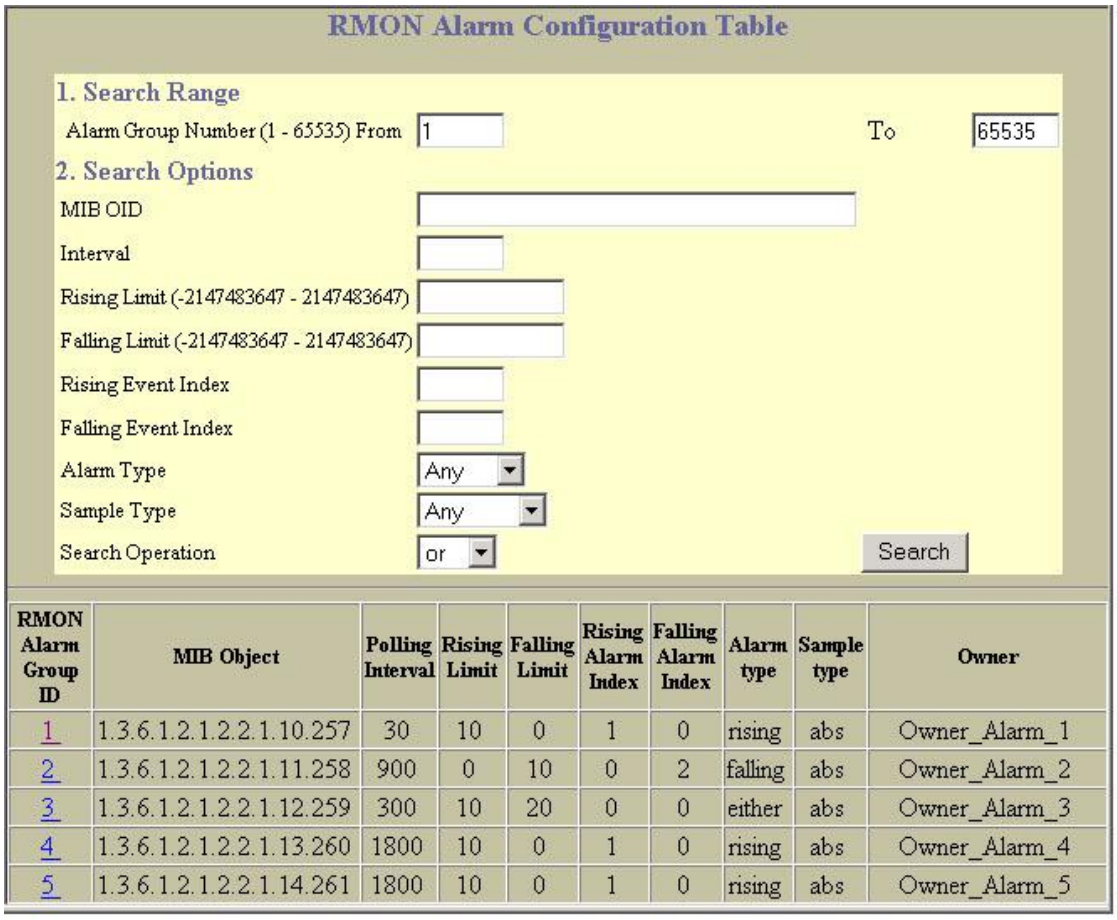
The following table describes the History Group Configuration controls:

Table 88 History Group Configuration controls

Control	Description
History Group ID (1-65535)	Configures a numeric identifier for the selected History index.
MIB Object ID	Configures the interface MIB Object Identifier. The interface OID can have a maximum of 127 characters.
Number of Buckets Requested (1-65535)	Configures the number of requested buckets, which is the number of data slots into which data is to be saved. The range is from 1 to 65535. The default is 30. Note: The maximum number of buckets that can be granted is 50.
Polling Interval (1-3600)	Configures the time interval over which the data is sampled for each bucket. The range is from 1 to 3600 seconds. The default value is 1800 seconds.
Owner	Enter a text string that identifies the person or entity that uses this History Group. The owner can have a maximum of 127 characters.

RMON Alarm Configuration Table

To display the following form, select RMON > Alarm (click the underlined text, not the folder).



RMON Alarm Group ID	MIB Object	Polling Interval	Rising Limit	Falling Limit	Rising Alarm Index	Falling Alarm Index	Alarm type	Sample type	Owner
1	1.3.6.1.2.1.2.2.1.10.257	30	10	0	1	0	rising	abs	Owner_Alarm_1
2	1.3.6.1.2.1.2.2.1.11.258	900	0	10	0	2	falling	abs	Owner_Alarm_2
3	1.3.6.1.2.1.2.2.1.12.259	300	10	20	0	0	either	abs	Owner_Alarm_3
4	1.3.6.1.2.1.2.2.1.13.260	1800	10	0	1	0	rising	abs	Owner_Alarm_4
5	1.3.6.1.2.1.2.2.1.14.261	1800	10	0	1	0	rising	abs	Owner_Alarm_5

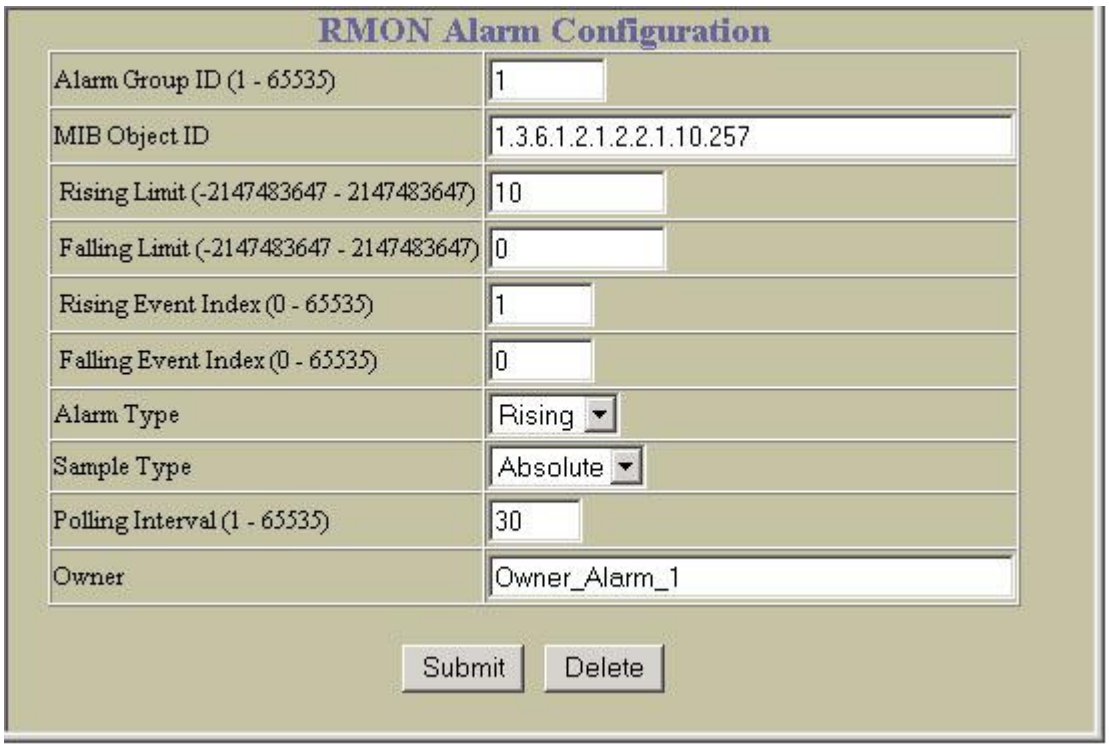
The following table describes the Alarm Groups Configuration controls:

Table 89 RMON Alarm Configuration controls

Control	Description
Search Range	To search for a RMON Alarm, enter a range of numbers in the From and To fields.
Search Options	To focus the search for a RMON Alarm, enter optional search parameters: • MIB OID • Interval • Rising Limit • Falling Limit • Rising Event Index • Falling Event Index • Alarm Type • Sample Type Fields that have a value of “any” are ignored during the search. Choose a search operation: • or: Search for Alarms specified in the search range that meet any of the criteria entered. • and: Search for Alarms specified in the search range that meet all of the criteria entered. Click Search to display RMON Alarms that fit the range and meet the criteria entered.

RMON Alarm Configuration

To display the following form, go to the RMON Alarm Groups Configuration form. Select an Alarm Group, or open the Alarm folder and click Add Alarm Group.



The following table describes the Alarm Group Configuration controls:

Table 90 Alarm Group Configuration controls

Control	Description
Alarm Group ID	Configures the numeric identifier of the Alarm index.
MIB Object ID	Configures an alarm MIB Object Identifier. The alarm OID can have a maximum of 127 characters.
Rising Limit	Configures the rising threshold for the sampled statistic. When the current sampled value is greater than or equal to this threshold, and the value at the last sampling interval was less than this threshold, a single event is generated.
Falling Limit	Configures the falling threshold for the sampled statistic. When the current sampled value is less than or equal to this threshold, and the value at the last sampling interval was greater than this threshold, a single event is generated.
Rising Event Index	Configures the rising alarm event index that is triggered when a rising threshold is crossed. The range is from 0 to 65535. The default value is 0.
Falling Event Index	Configures the falling alarm event index that is triggered when a falling threshold is crossed. The range is from 0 to 65535. The default value is 0.
Alarm Type	Configures the alarm type as rising, falling, or either (rising or falling).
Sample Type	Configures the method of sampling the selected variable and calculating the value to be compared against the thresholds, as follows: • abs: absolute value, the value of the selected variable is compared directly with the thresholds at the end of the sampling interval. • delta: delta value, the value of the selected variable at the last sample is subtracted from the current value, and the difference compared with the thresholds.
Polling Interval	Configures the time interval over which data is sampled and compared with the rising and falling thresholds. The range is from 1 to 3600 seconds. The default is 1800 seconds.
Owner	Enter a text string that identifies the person or entity that uses this alarm index. The owner can have a maximum of 127 characters.

RMON Event Configuration Table

To display the following form, select RMON > Event (click the underlined text, not the folder).

RMON Event Configuration Table
1. Search Range
Event Group Number (1 - 65535) From 1 To 65535
2. Search Options
RMON Type Any
Search Operation or Search
RMON Event Group ID | Event Type | Description | Owner
1 | both | Event_1 | Owner_Event_1
2 | none | Event_2 | Owner_Event_2_nologortrap
3 | log | Event_3 | Owner_Event_3_logonly
4 | trap | Event_4 | Owner_Event_4_traponly
5 | both | Event_5 | Owner_Event_5

The following table describes the Event Groups Configuration controls:

Table 91 RMON Event Configuration controls

Control	Description
Search Range	To search for a RMON Event Group, enter a range of numbers in the From and To fields.
Search Options	To focus the search for an Event Group, enter optional search parameters: • RMON Type Fields that have a value of “any” are ignored during the search. Choose a search operation: • or: Search for Events specified in the search range that meet any of the criteria entered. • and: Search for Events specified in the search range that meet all of the criteria entered. Click Search to display Events that fit the range and meet the criteria entered.

RMON Event Configuration

To display the following form, go to the RMON Event Groups Configuration form. Select an Event Group, or open the Event folder and click Add Event Group.

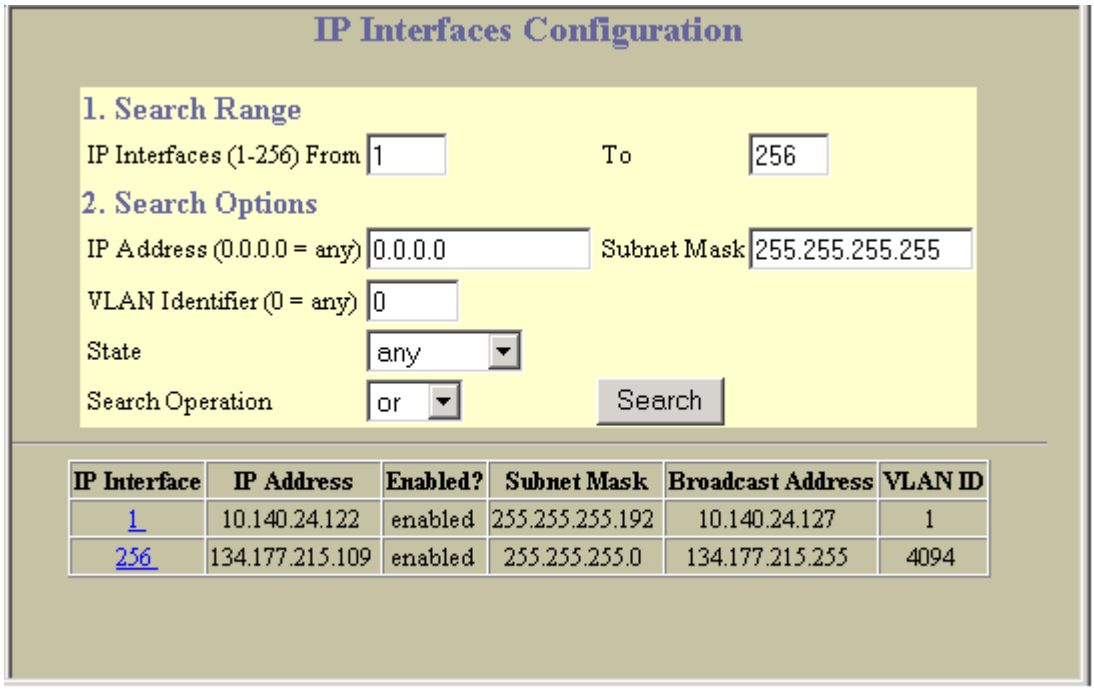
The following table describes the Event Group Configuration controls:

Table 92 Event Group Configuration controls

Control	Description
Event Group ID	Configures the numeric identifier of this Event index.
Event Type	Selects the type of notification provided for this event. For log events, an entry is made in the log table and sent to the configured syslog host. For trap events, an SNMP trap is sent to the management station (`/cfg/snmp/trap`).
Description	Enter a text string to describe the event. The description can have a maximum of 127 characters.
Owner	Enter a text string that identifies the person or entity that uses this Event index. The owner can have a maximum of 127 characters.

IP Interfaces Configuration

To display the following form, select Layer 3 > IP Interfaces (click the underlined text, not the folder).


IP Interfaces Configuration
1. Search Range
IP Interfaces (1-256) From 1
To 256
2. Search Options
IP Address (0.0.0.0 = any) 0.0.0.0
Subnet Mask 255.255.255.255
VLAN Identifier (0 = any) 0
State any
Search Operation or
Search
IP Interface | IP Address | Enabled? | Subnet Mask | Broadcast Address | VLAN ID
1 | 10.140.24.122 | enabled | 255.255.255.192 | 10.140.24.127 | 1
256 | 134.177.215.109 | enabled | 255.255.255.0 | 134.177.215.255 | 4094

This form summarizes IP Interface parameters.

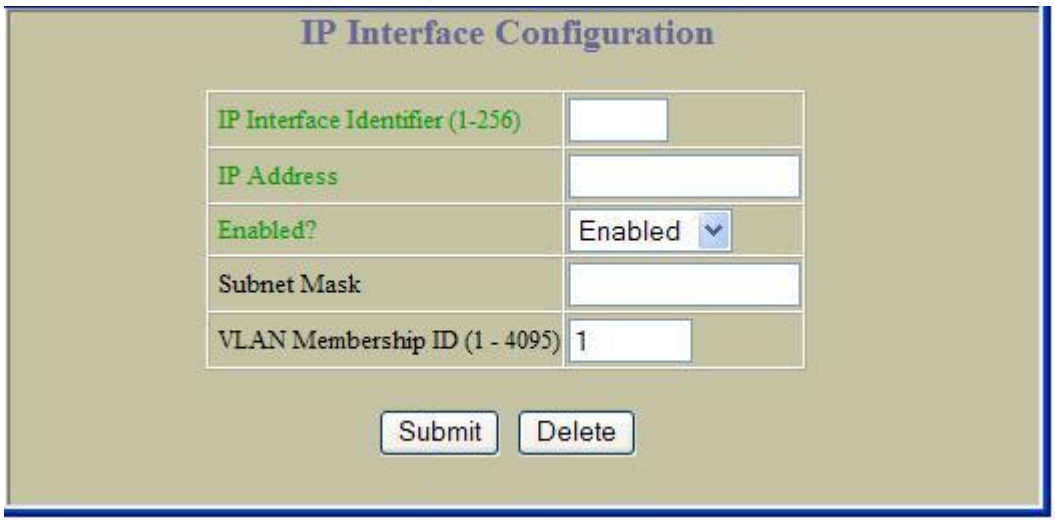
The following table describes IP Interfaces Configuration controls:

Table 93 IP Interfaces Configuration controls

Control	Description
Search Range	To search for an IP Interface, enter a range of IP Interface numbers in the From and To fields.
Search Options	To focus the search for an IP Interface, enter optional search parameters: • IP Address • Subnet Mask • VLAN ID number • IP Interface State Fields that have a value of “any” are ignored during the search. Choose a search operation: • or: Search for IP Interfaces specified in the Search range that meet any of the criteria entered. • and: Search for IP Interfaces specified in the Search range that meet all of the criteria entered. Click Search to display IP Interfaces that fit the range and meet the criteria entered.

IP Interface Configuration

To display the following form, go to the IP Interfaces Configuration form. Select an IP Interface number, or open the IP Interfaces folder and click Add IP Interface.



The switch can be configured with up to 256 IP interfaces. Each IP interface represents the switch on an IP subnet on your network. The Interface option is disabled by default.

The following table describes the IP Interface Configuration controls:

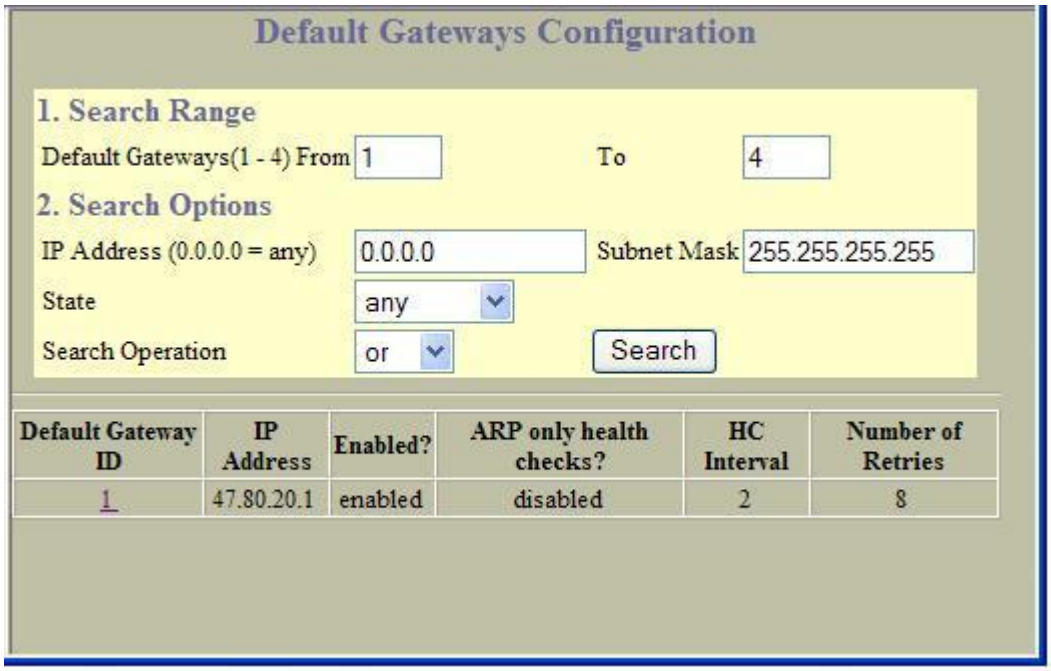
Table 94 IP Interface Configuration controls

Control	Description
IP Interface Identifier (1-256)	Selects an IP interface to configure.
IP Address	Configures the IP address of the switch interface using dotted decimal notation.
Enabled?	Enables or disables this IP interface.
Subnet Mask	Configures the IP subnet address mask for the interface using dotted decimal notation.
VLAN Membership ID (1-4095)	Configures the VLAN number for this interface. Each interface can belong to one VLAN, although any VLAN can have multiple IP interfaces in it.

NOTE: IP Interface 256 is reserved for switch management.

Default Gateways Configuration

To display the following form, select IP Menu > Default Gateways (click the underlined text, not the folder).



This form summarizes default gateway parameters.

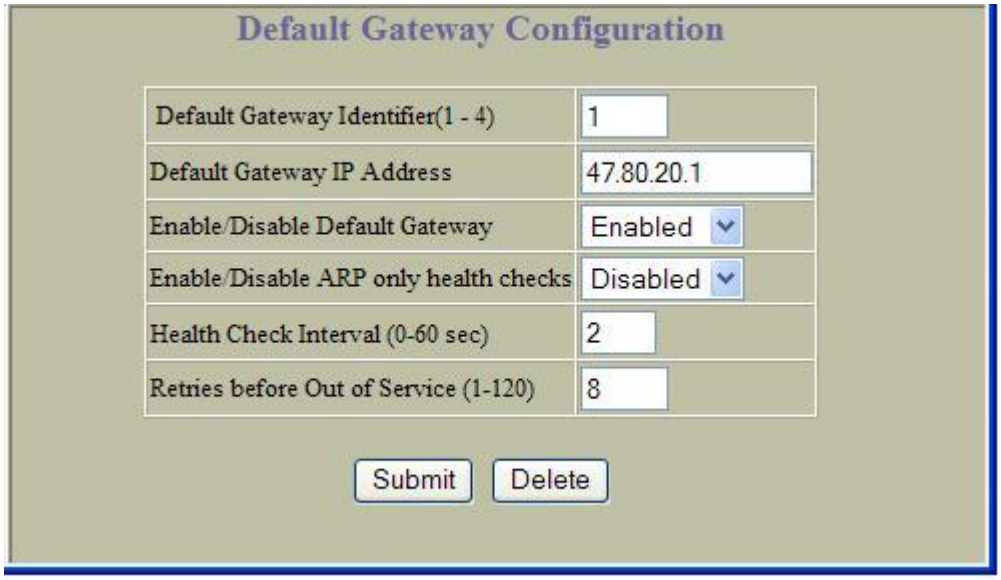
The following table describes the Default Gateways Configuration controls:

Table 95 Default Gateways Configuration controls

Control	Description
Search Range	To search for a Default Gateway, enter a range of Gateway numbers in the From and To fields.
Search Options	To focus the search for a Default Gateway, enter optional search parameters: • IP Address • Subnet Mask • Default Gateway State Fields that have a value of “any” are ignored during the search. Choose a search operation: • or: Search for Default Getaways specified in the search range that meet any of the criteria entered. • and: Search for Default Getaways specified in the search range that meet all of the criteria entered. Click Search to display Default Getaways that fit the range and meet the criteria entered.

Default Gateway Configuration

To display the following form, go to the Default Gateways Configuration form. Select a Default Gateway ID, or open the Default Gateways folder and click Add Default Gateway.



Default Gateways are disabled by default.

The following table describes the Default Gateway Configuration controls:

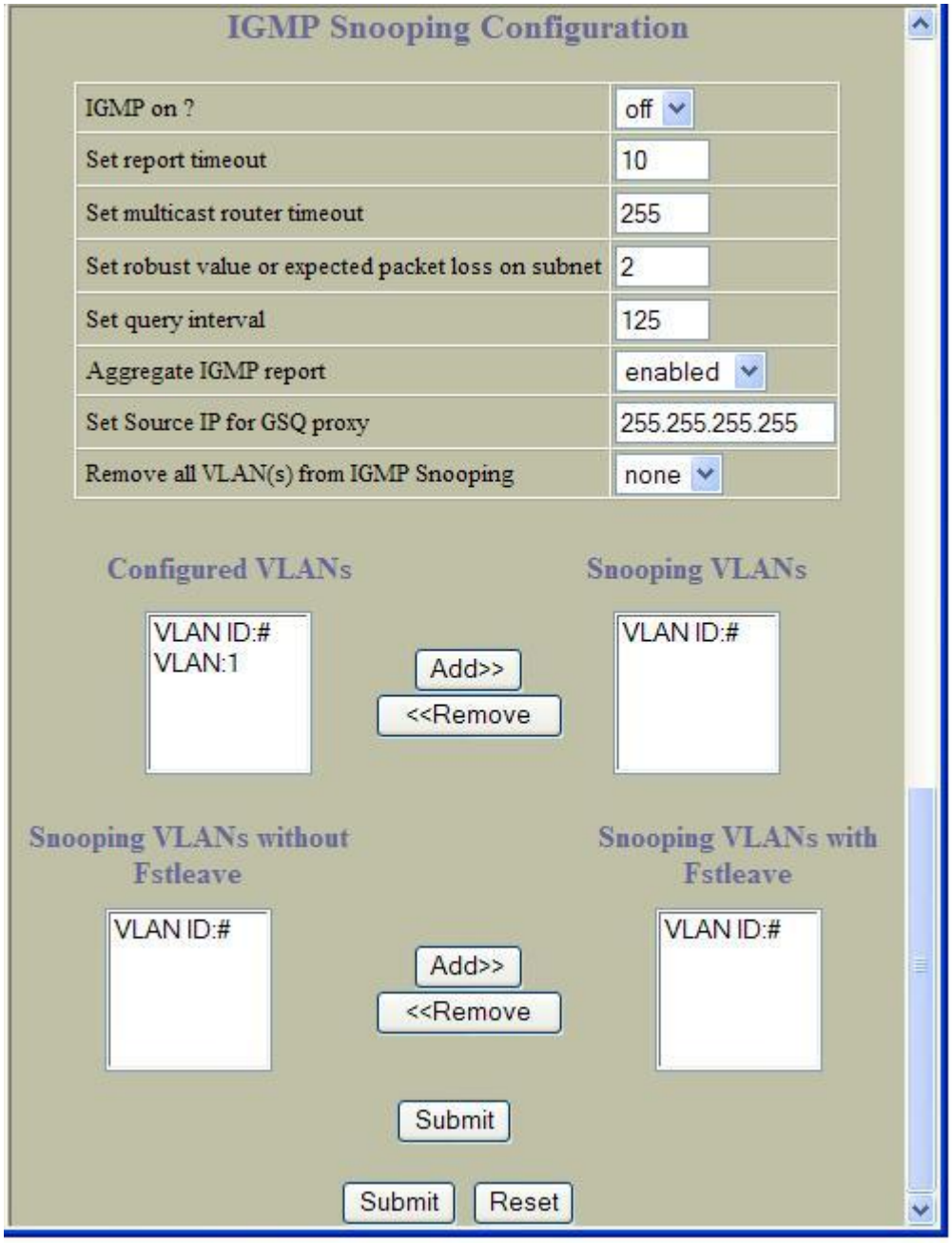
Table 96 Default Gateway Configuration controls

Control	Description
Default Gateway Identifier (1-4)	Selects a default Gateway to configure.
Default Gateway IP Address	Configures the IP address of the default IP gateway using dotted decimal notation.
Enable/Disable Default Gateway	Enables or disables the gateway for use.
Enable/Disable ARP only health checks	Enables or disables Address Resolution Protocol (ARP) health checks. This command is disabled by default.
Health Check Interval (0-60 sec)	The switch pings the default gateway to verify that it's up. The interval option sets the time between health checks. The range is from 0 to 60 seconds. The default is 2 seconds.
Retries before Out of Service (1-120)	Sets the number of failed health check attempts required before declaring this default gateway inoperative. The range is from 1 to 120 attempts. The default is 8 attempts.

NOTE: Default Gateway 4 is reserved for switch management.

IGMP Snooping Configuration

To display the following form, select Layer 3 > IGMP > IGMP Snooping (click the underlined text, not the folder).



Internet Group Management Protocol (IGMP) is used by IP Multicast routers to learn about the existence of host group members on their directly attached subnet (see RFC 2236).

IGMP Snooping allows the switch to forward multicast traffic only to those ports that request it. IGMP Snooping prevents multicast traffic from being flooded to all ports. The switch learns which server hosts are interested in receiving multicast traffic, and forwards it only to ports connected to those servers.

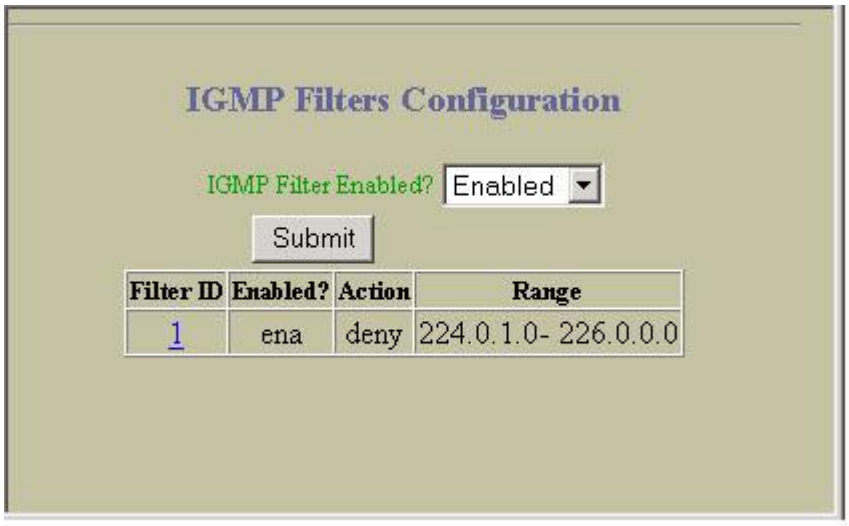
The following table describes the IGMP Snooping Configuration controls:

Table 97 IGMP Snooping Configuration controls

Control	Descriptions
IGMP on?	Enables or disables IGMP Snooping.
Set report timeout	Configures the timeout value for IGMP Membership Reports (host). Once the timeout value is reached, the switch removes the host from its IGMP table, if the conditions are met. The range is from 1 to 255 seconds. The default is 10 seconds.
Set multicast router timeout	Configures the timeout value for IGMP Membership Queries (Mrouter). Once the timeout value is reached, the switch removes the multicast router from its IGMP table, if the proper conditions are met. The range is from 1 to 255 seconds. The default is 255 seconds.
Set robust value or expected packet loss on subnet	Configures the IGMP Robustness variable, which allows you to tune the switch for expected packet loss on the subnet. If the subnet is expected to be lossy (high rate of packet loss), increase the value. The range is from 2 to 10. The default value is 2.
Set query interval	Sets the IGMP router query interval, in seconds. The default value is 125.
Aggregate IGMP report	Enables or disables IGMP Membership Report aggregation.
Set Source IP for GSQ proxy	Configures the source IP address used as a proxy for IGMP Group Specific Queries.
Remove all VLANs from IGMP Snooping	Removes all VLANs from the list of Snooping VLANs.
Configured VLANs	Lists the VLANs that can be assigned for IGMP Snooping.
Snooping VLANs	Enables or disables IGMP Snooping on selected VLANs. Add: Adds selected VLANs to the Snooping VLANs list. To add a VLAN, select the VLAN in the Configured VLANs list, and click Add. Remove: Removes selected VLANs from the Snooping VLANs list.
Snooping VLANs without Fstleave	Lists the Snooping VLANs that can be assigned for Fstleave processing.
Snooping VLANs with Fstleave	Enables or disables Fastleave processing. Fastleave allows the switch to immediately remove a port from the IGMP port list, if the host sends a Leave message, and the proper conditions are met. This command is disabled by default. Add: Adds selected VLANs to the Snooping VLANs with Fstleave list. To add a VLAN, select the VLAN in the Snooping VLANs without Fstleave list, and click Add. Remove: Removes selected VLANs from the Snooping VLANs with Fstleave list.

IGMP Filters Configuration

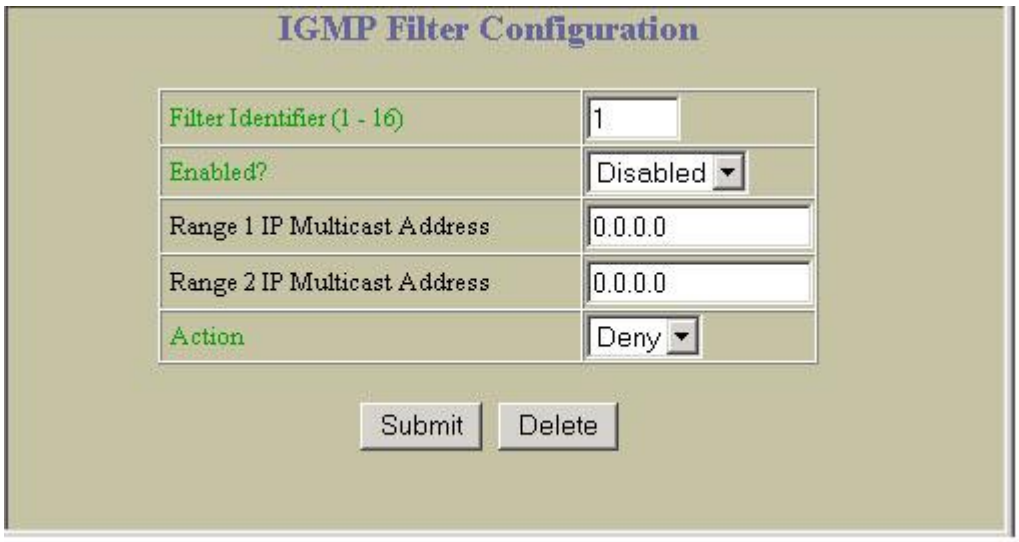
To display the following form, select Layer 3 > IGMP > IGMP Filters (click the underlined text, not the folder).



This form summarizes IGMP filter parameters. Use IGMP filters to allow or deny a port to send and receive multicast traffic.

IGMP Filter Configuration

To display the following form, go to the IGMP Filters Configuration form. Select a Filter ID, or open the IGMP Filters folder and click Add Filter.



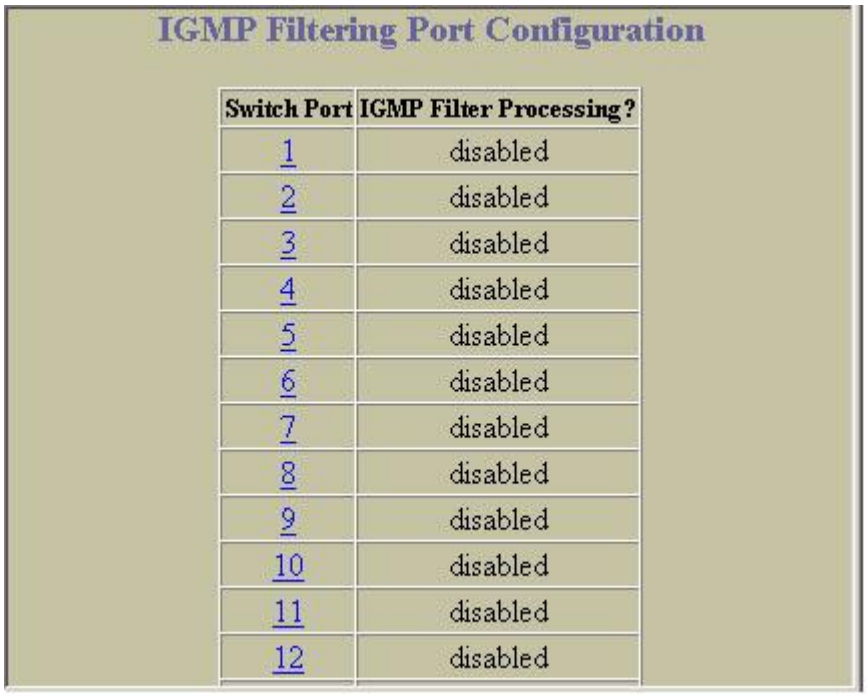
The following table describes the IGMP Filter Configuration controls:

Table 98 IGMP Filter Configuration controls

Control	Description
Filter Identifier (1 - 16)	Selects an IGMP filter to configure.
Enabled?	Enables or disables this IGMP filter.
Range 1 IP Multicast Address	Configures the start of the range of IP multicast addresses for this filter.
Range 2 IP Multicast Address	Configures the end of the range of IP multicast addresses for this filter.
Action	Allows or denies multicast traffic for the IP multicast address range specified.

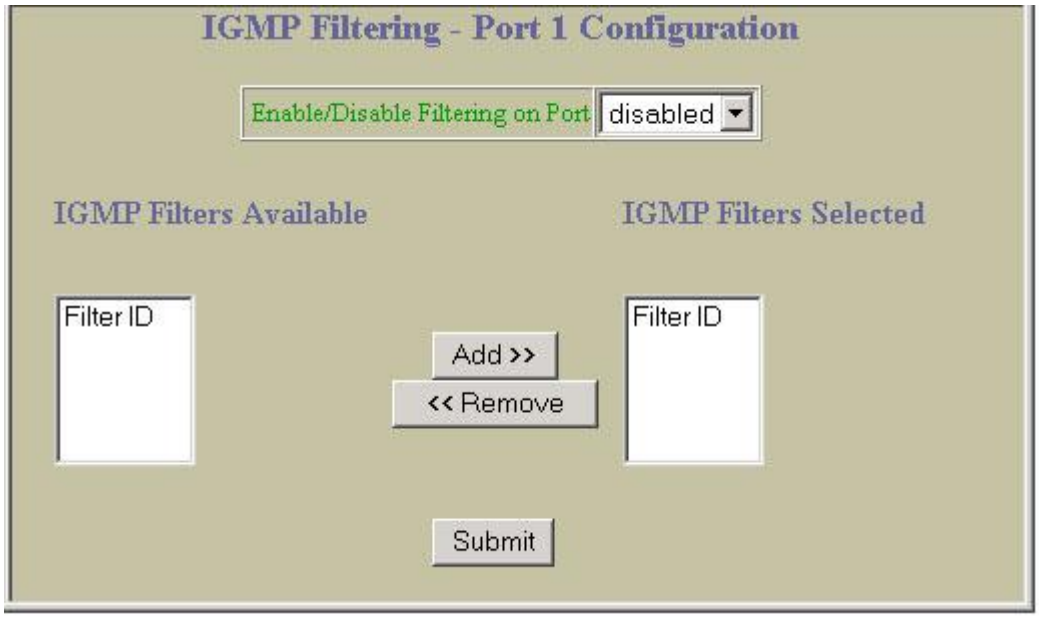
IGMP Filtering Port Configuration

To display the following form, select Layer 3 > IGMP > Switch Ports.



IGMP Filtering - Port Configuration

To display the following form, go to the IGMP Filtering Port Configuration form. Select a Switch Port number.



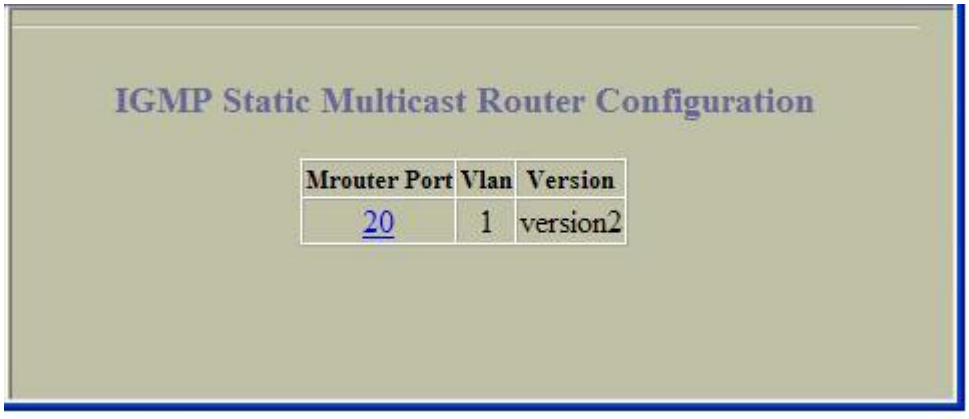
The following table describes IGMP Filtering – Port Configuration controls:

Table 99 IGMP Filtering - Port Configuration controls

Control	Description
Enable/Disable Filtering on Port	Enables or disables IGMP filtering on the port.
IGMP Filters Available	Lists the filters that you can add to the port.
IGMP Filters Selected	Lists the filters that have been added to the port. Select a filter number in the IGMP Filters Available list and click Add to add the filter to the port. Select a filter number in the IGMP Filters Selected list and click Remove to remove the filter from the port.

IGMP Static Multicast Router Configuration

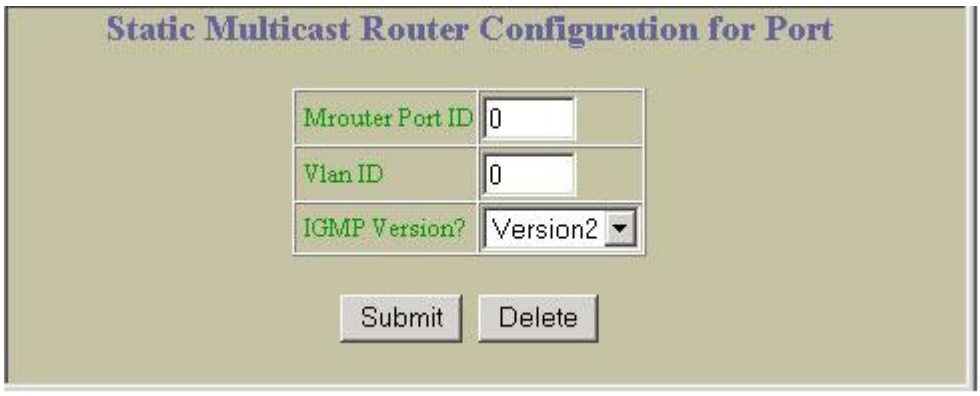
To display the following form, select Layer 3 > IGMP > IGMP Static MRouter (click the underlined text, not the folder).



This form provides a summary of configured Static Multicast Routers.

Static Multicast Router Configuration for Port

To display the following form, go to the IGMP Static Multicast Router Configuration form. Select an Mrouter Port number, or open the IGMP Static Mrouter folder and click Add Mrouter.



NOTE: When you configure a static multicast router on a VLAN, the process of learning multicast routers is disabled for that VLAN.

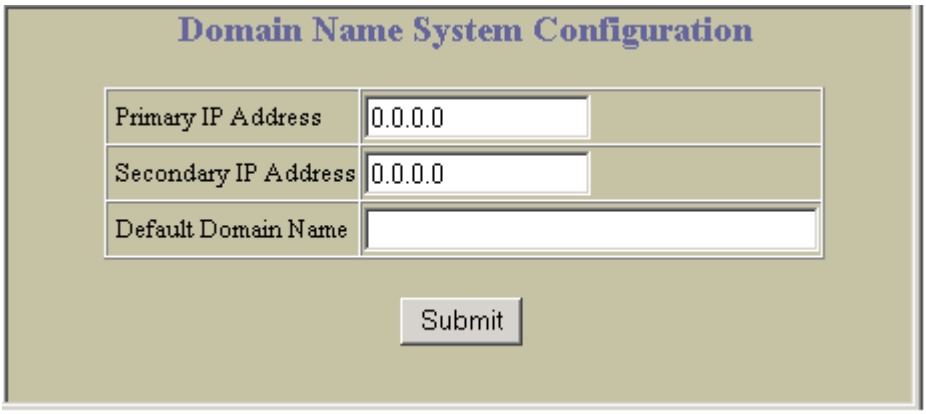
The following table describes the Static Multicast Router Configuration for Port controls:

Table 100 Static Multicast Router Configuration for Port controls

Control	Description
Mrouter Port ID	Selects a port on which the static multicast router is connected. Note: Port number must be an external port (20-24).
Vlan ID	Selects a VLAN on which the static multicast router is connected.
IGMP Version?	Configures the IGMP version (1 or 2) of the multicast router.

Domain Name System Configuration

To display the following form, select Layer 3 > Domain Name System.



The Domain Name System (DNS) Menu is used for defining the primary and secondary DNS servers on your local network, and for setting the default domain name served by the switch services. DNS parameters must be configured prior to using hostname parameters with the `ping`, `traceroute`, and `tftp` commands.

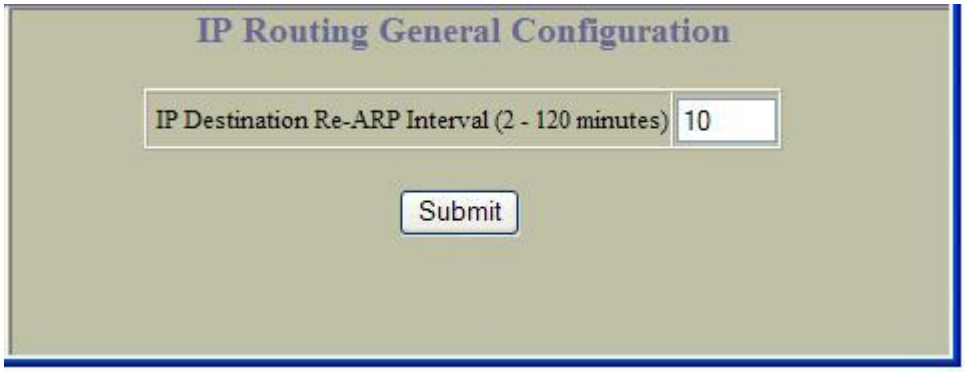
The following table describes the Domain Name System Configuration controls:

Table 101 Domain Name System Configuration controls

Control	Description
Primary IP Address	Sets the IP address for your primary DNS server. Use dotted decimal notation.
Secondary IP Address	Sets the IP address for your secondary DNS server. If the primary DNS server fails, the configured secondary will be used instead. Enter the IP address using dotted decimal notation.
Default Domain Name	Sets the default domain name used by the switch. For example: `mycompany.com`.

IP Routing General Configuration

To display the following form, select Layer 3 > General.



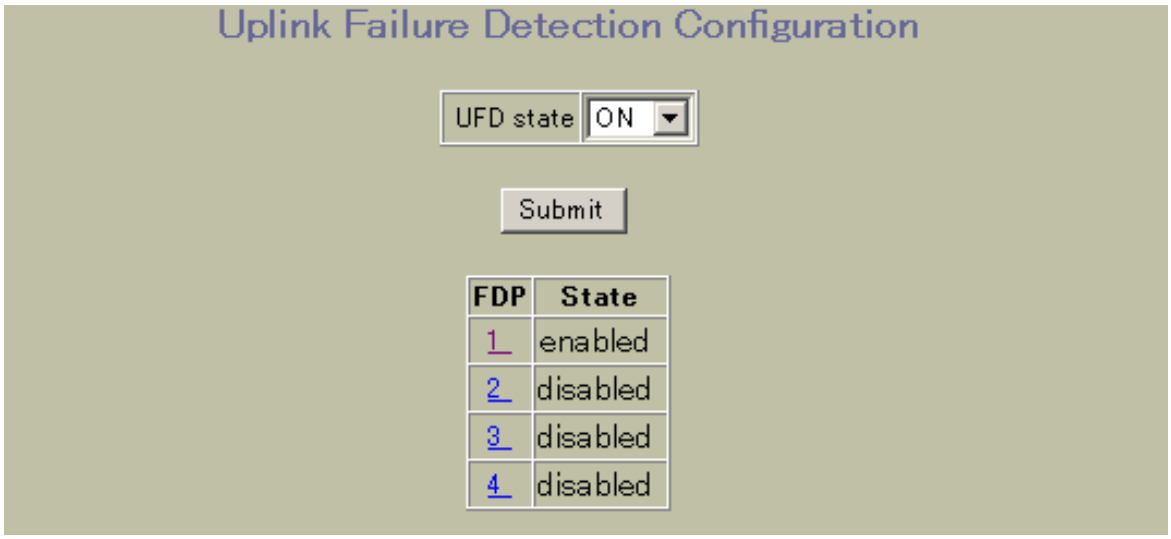
The following table describes the IP Routing General Configuration controls:

Table 102 IP Routing General Configuration controls

Control	Description
IP Destination Re-ARP Interval (2-120 minutes)	Sets the re-ARP period in minutes. The switch periodically sends ARP (Address Resolution Protocol) requests to refresh its address database. This command is used for setting the interval between ARP refreshes of the next IP address in the database. The default interval is 10 minutes.

Uplink Failure Detection Configuration

To display the following form, select Uplink Failure Detection (click the underlined text, not the folder).



Uplink Failure Detection (UFD) supports network fault tolerance in network adapter teams. Use this menu to configure a Failure Detection Pair of one Links to Monitor (LtM) group and one Links to Disable (LtD) group. When UFD is enabled and a Failover Pair is configured, the switch automatically disables ports in the LtD if it detects a failure in the LtM. The failure conditions which are monitored in the LtM group include port link state moving to down, or port state moving to Blocking if Spanning Tree Protocol is enabled.

The following table describes the Uplink Failure Detection (UFD) configuration controls:

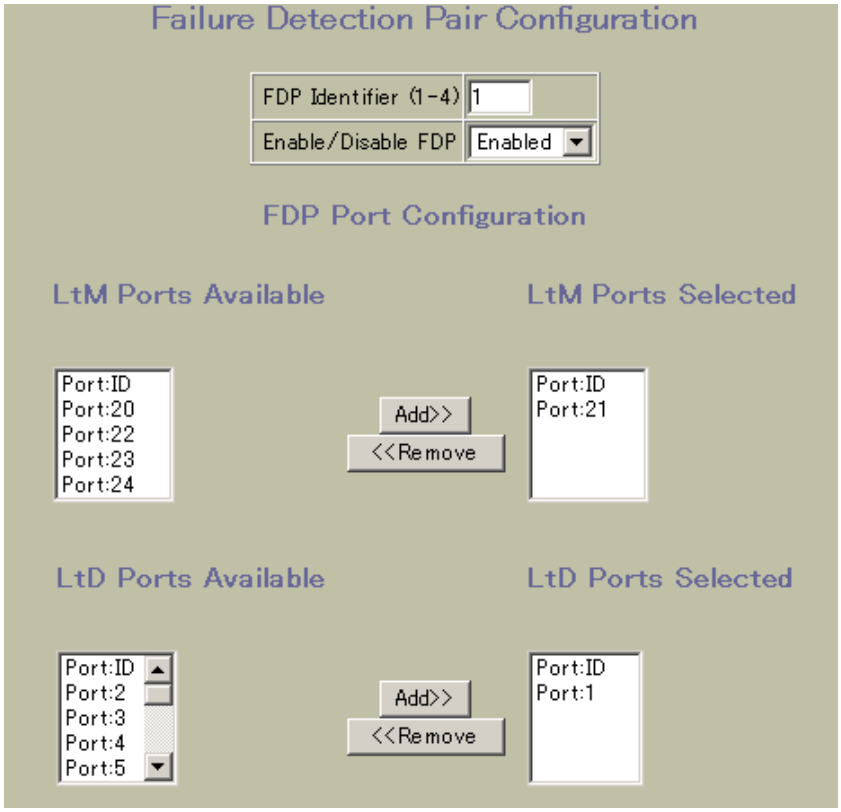
Table 103 Uplink Failure Detection Configuration controls

Control	Description
UFD state	Globally turns UFD on or off.
FDP	Displays the Failure Detection Pair Configuration form.

Failure Detection Pair Configuration

To display the following form, select Uplink Failure Detection (click the underlined text, not the folder). On the UFD Configuration form, select FDP.

This information depends on the software version. One UFD is displayed on software version 1.0.0.



The following table describes the Failure Detection Pair Configuration controls:

Table 104 Failure Detection Pair Configuration controls

Control	Description
Enable/Disable FDP	Enables or disables the Failover Pair.
LtM Ports Available	Lists the ports that can be added to the Link to Monitor (LtM). Only uplink ports (20-24) are allowed in the LtM.
LtM Ports Selected	Lists the ports that are members of the LtM. Select a port number in the LtM Ports Available list and click Add to add the port to the LtM. Select a port number in the LtM Ports Selected list and click Remove to remove the port from the LtM.
LtD Ports Available	Lists the ports that can be added to the Link to Disable (LtD). Only downlink ports (1-16) are allowed in the LtD.
LtD Ports Selected	Lists the ports that are members of the LtD. Select a port number in the LtD Ports Available list and click Add to add the port to the LtD. Select a port number in the LtD Ports Selected list and click Remove to remove the port from the LtD.
LtM Trunks Available	Lists the trunk groups that can be added to the Link to Monitor (LtM). The LtM trunk group can contain only uplink ports (20-24).
LtM Trunks Selected	Lists the trunk groups that are members of the LtM. Select a trunk group number in the LtM Trunks Available list and click Add to add the trunk group to the LtM. Select a trunk group number in the LtM Trunks Selected list and click Remove to remove the trunk group from the LtM.
LtD Trunks Available	Lists the trunk groups that can be added to the Link to Disable (LtD). LtD trunk groups can contain only downlink ports (1-16).
LtD Trunks Selected	Lists the trunk groups that are members of the LtD. Select a trunk group number in the LtD Trunks Available list and click Add to add the trunk group to the LtD. Select a trunk group number in the LtD Trunks Selected list and click Remove to remove the trunk group from the LtD.